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ABSTRACT

Intended to influence school districts that have the opportunity to build new schools, this document provides new designs for comprehensive high schools that would overcome the mismatch between school and life, the inequity of educational outcomes, and the lack of organizational effectiveness that plague many contemporary high schools. The designs were developed by teachers, administrators, support staff, state education office staff, teacher educators, and policy makers. Following an introduction, the document contains the following sections: Learning Signature; Learner Outcomes; Learning Process; Learning Oganization; Learning Decision Making; Learning Partnerships; Learning Staff; Learning Technology; Learning Environment; Learning Costs; a summary of unique contributions, lessons learned, and recommended next steps. A list of 81 references concludes this volume. (CML)

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NEW DESIGNS FOR THE COMPREHENSIVE HIGH SCHOOL

VOLUME I

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NEW DESIGNS FOR THE COMPREHENSIVE HIGH SCHOOL

VOLUME I

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NEW DESIGNS FOR THE COMPREHENSIVE HIGH SCHOOL

Volume 1

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ACKNOWLEDGMENTS

Throughout this study, we assumed that the comprehensive high school was "people made" and, therefore, that women and men, young and old, together can reawaken the potential of this distinctly American secondary school organization. Jonathan Kozol (1984) expressed the assumption well when he said:

> Public schools did not exist forever. They did not come out of the forehead of a Greek or Roman god. They were contrived by ordinary men and women . . . and, for just this reason, they can be rebuilt or reconceived, dismantled or replaced, not by another set of gods, but by plain men and women. . . . You and I can leave school as it is, can change it slightly, or else we can turn it inside out and upside down. (p. 8)

We acknowledge that the reawakening envisioned in the report would not have been possible without the genuine, committed, and imaginative participation of some extraordinary "ordinary men and women."

Charles Benson, Director of the National Center for Research in Vocational Education, and Paul Cole, Secretary-Treasurer of the New York State AFL-CIO and Vice-President of the American Federation of Teachers, identified the necessity of redefining the comprehensive high school and the uncommon contribution that could be made by vocational education. They initiated the reawakening by suggesting that we think about the design of a "Leonardo da Vinci" high school.

Special thanks and acknowledgment go to the individuals who served on the Design Group, participated in focus groups, and staffed the work of this research. We also wish to pay tribute to the organizations in which these people work and learn.

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DEDICATION IN MEMORIAL TO ROBERT H. BECK

The final report of the project, *New Designs for the Comprehensive High School*, is dedicated in memorial to Robert H. Beck, whose ideas and ideals were directly at play during the inception and first year of this project. Robert Beck was a Regents' Professor of History and Philosophy of Education at the University of Minnesota and Co-Director of this project at its start. Unfortunately, and to the loss of the project staff and the Design Group who had grown very fond of his personal qualities and penetrating insights, Professor Beck died in December, 1991.

Robert Beck joined the University of Minnesota faculty in 1947. He obtained his A.B. (cum laude) from Harvard in 1939 and his Ph.D. from Yale in 1942. During his professional career he served as president of the Philosophy of Education Society and of the Society of Professors of Education. Bob had a wide range of professional interests: philosophy, progressive education, history of ideas, education in classical antiquity and Renaissance Italy, comparative education, and vocational education as a part of general education. Bringing these different subjects together—linking themes and people not often linked—was his specialty.

As a colleague and friend, Bob Beck will be remembered especially for his graciousness, his generosity of spirit, and his gentle sense of humor.

PREFACE

New Designs for the Comprehensive High School summarizes educational research carried out in 1991 and 1992. It was applied research targeted to future designs of the comprehensive high school, a common educational site for vocational and academic education in the United States. This investigation, led by Co-Directors Robert Beck and George Copa, took place during the fourth and fifth years of a five-year program of research that was primarily directed toward enhancing the general education available to all young people, involving both sound vocational and academic education in close collaboration and interaction.

Throughout their professional careers Professors Beck and Copa have had a special concern for the learners and the educational staff of public secondary schools in the United States and in other countries. It was their hope that by bringing together individuals with similar concerns about the future of the high school, innovative, yet practical, design ideas would emerge.

Copa believes vocational education as a professional field is in need of a more intellectually convincing framework for its subject matter. Since the introduction of vocational education as a curricular category in the nation's public schools at the beginning of the twentieth century, it has taken its basic direction and substance from federal legislation. While this support is applauded as evidence of continuing, significant support, the legislative arena does not provide an intellectual framework. In *A Framework for the Subject Matter of Vocational Education*, Copa (1992) began the identification of a conceptual framework for the subject matter, presented here as a précis.

The curricular content of vocational education is learning that enhances success in vocational responsibilities characteristic of an educated person. Vocational responsibilities are made up largely of work and family responsibilities, the problems or concerns encountered in everyday life. These problems or concerns arise when there is discrepancy in work and family life between the desired state of affairs and the present state of affairs. The proposed framework for the subject matter of vocational education focuses attention on seven problem areas: (1) understanding vocational life, (2) rights and responsibilities in vocational life, (3) relationships in vocational life, (4) technology and vocational life,

(5) general vocational life competence, (6) specific vocational life competence, and (7) managing vocational life.

In Copa and Tebbenhoff's (1990) *Subject Matter of Vocational Education: In Pursuit of Foundations*, the interrelationship between vocational and academic subject matter is examined. They say that learning to deal with the problems of vocational life begins with problem identification and "backs into" the needed knowledge. As such, the content of vocational education backs into the various academic disciplines; the academic disciplines provide the foundational content and the vocational context gives more meaning to the disciplines. The foundational content is integrated into the various components of resolving the problems of vocational life, with practical reasoning guiding the thinking processes. Therefore, the methods of vocational education stress sustained thinking about difficult problems that have real consequences in the context of vocational responsibilities. Attention is on the application of basic, general, and higher order skills and requiring real, experiential activities.

Beck had an abiding interest in both the general and the vocational-technical education of a nation's citizens. He expressed his concerns and ideas in three publications: *Polytechnical Education: A Step* (1990a), *Vocational Preparation and General Education* (1990b), and *General Education: Vocational and Academic Collaboration* (1991). The historical record shows that a universal component of a country's system of education has been called general education. The term "general" was to imply that all members of the society, all citizens at least, were to command what made up the general education.

While general education has been evident for centuries, its content has been altered with the pressures of a particular time and place. Today, it is common knowledge that some degree of acquaintance with technology, its scientific and mathematical base, together with its social and cultural consequences, is essential to a general education in the high school. Vocational preparation, at the secondary level and beyond, certainly has been transformed by science and technology.

The reality of this transformation of vocational preparation is due to what is happening in society and culture. Academic subjects, especially the social studies, should show this to be true and have a good deal to contribute to, and take from, vocational studies. Collaborating vocational and academic teachers should profit from sharing their insights into what is happening to society and culture and why it is happening.

In year three of their research, Beck and Copa—now joined by Ginny Pease who also had an intense interest in improving high schools—pilot tested their ideas about collaboration and the integration of vocational and academic education in two comprehensive high schools. The curricular innovations that resulted from the collaboration were described and analyzed in *An Uncommon Education: Interaction and Innovation* by Beck, Copa, and Pease (1991). Evidence from the collaborators indicated that there were many barriers to implementing interactive and integrated learning processes in the traditional comprehensive high school. This suggested that, despite the motivation and efforts by teachers, counselors, and administrators, the school's organization often prevented them from realizing an enriched educational experience for all learners and for themselves. The study concluded that "a twenty-first century education was struggling to be born in nineteenth century facilities" (Prairie School, 1992). To move forward, vocational and academic staffs would have to come together to find new ways to redesign their environments, eliminate the invisible walls that separated their departments, and break through the "glass ceiling" limiting the potential for everyone in the comprehensive high school.

INTRODUCTION

The Problem

The economy, the economy, the economy is the pressing social problem facing the United States and most other countries throughout the world. When probed for specifics, the economic problem quickly translates into the less than desirable state of affairs in families, workplaces, and communities. Several strategies are often proposed to improve the state of affairs in these settings; improving education is always near the top of the list of strategies. Particularly for the United States, attention focuses on improving the high school. From an outside-the-school perspective, the problem with high schools in the United States usually focuses on cost and lack of sufficient learning of the needed kind. On closer examination, the problem with high schools turns on three problem areas.

First, most teenagers today attend high schools that show little connection to what is happening in their work, families, and communities. Students are caught in limbo. Far too many respond by showing disdain for instructional content and methods. School is boring, many students say. What they mean is that they are unable to connect what they are learning to its usefulness in life. Without meaningful connections, the motivation to learn is lost, making high schools destined for extinction as productive organizations.

Second, in today's information-centered world too many students still are pre-sorted and channeled into "tracks" of learners which foster inequity and consign many to diets of "scholastic junk food." All students need to be prepared to interpret what they read, to solve real problems, and to make wise decisions. They deserve the flexibility that permits them to move and change directions comfortably in a world that requires many choices. All students need a sound general education and opportunities to develop specific skills directly useful in work, family, and community life.

Third, generally lacking in today's educational system is a common vision for—and solid commitment to—clear educational goals linked to straightforward, educational strategy focused on quality. Education needs to be organized and operated as a process that encourages continual progress and improvement in enhancing learning by students.

These, then, are the problems toward which this report is directed—the mismatch of school and life, the inequity in educational outcome, and the lack of organizational effectiveness. Entirely new designs are required for the high school in this context.

Solutions to these problems lay in the best ideas and practices of vocational and academic education, but not because better vocational education is a way to motivate students to do serious academic work. Rather, a redesigned comprehensive high school should serve as the context for enriched vocational and academic learning because both are important to students, to the country, and to the world. This is the genius of the Renaissance and the heart of what was in mind as an aim for this project.

A New Vision

Envision a comprehensive high school that exemplifies the renaissance of a new breed of school because it reawakens the potential of all learners, staff, and communities. By design, this school will turn the conventional assumptions about high school upside-down. It is "new" in the sense that it represents the best of the old-and-proven, but breaks through current educational practice so that high school will work for all students and for this nation.

Envision a school with a renaissance character that gives focus, coherence, and spirit to learning. Envision a school with a more level "playing field" for all students and a guarantee of challenging learner outcomes for every student who lives within the geographic boundaries of a school district—learner outcomes that prepare young people for the challenges and opportunities they now or will face in their family, work, and community lives. Envision a school that operates as a learning community, and where learner outcomes, the learning process, school organization, staffing, and partnerships with other organizations and agencies all are fully aligned and unified.

Envision a school with an environment so rich in discovery opportunities that learning is a naturally occurring phenomenon that is engaging and self-motivating. Envision a school designed for the display and demonstration of learning, and does this all at a cost that is no greater than that of schools today. This is the vision we have as we share the specifications for new designs for the comprehensive high school.

Project Purpose

The mission of the project entitled "New Designs for the Comprehensive High School" was to influence those who had responsibility for future designs for the comprehensive high school, giving voice to both the interests of vocational education and academic education. With this mission in mind, the major goal was to synthesize concepts, ideas, research findings, and innovative practices on all components of high school design. The unique scope of the project was to bring together information from a wide variety of sources and to do this for all aspects of school design. This purpose ensured that design specifications were at the leading edge, internally coherent, and aligned. Many other projects have examined one or more components of high school design, but did not bring the separate pieces together into a cohesive whole.

The resulting designs were to provide a roadmap or blueprint to guide longer-range planning and policy so that advantage can be taken of opportunities to put cohesive, whole designs into place. By developing new designs in sufficient detail to include learner outcomes, learning processes, organization, staffing, and partnerships, the designs could be presented in realistic ways able to influence decisionmakers in the areas of benefits, changes, and costs.

The project was to draw on the latest findings of educational research, particularly the work of the National Center for Research in Vocational Education (NCRVE) as the sponsoring agency. The project also was viewed as a way to bring the results of NCRVE research together with other research. NCRVE had done considerable work focused on integrating vocational and academic education, articulating secondary and postsecondary educational programs, modernizing the subject matter of vocational education, and building partnerships between schools and the community. The project would also incorporate insights gained from other exemplary projects and natural variations in high school structures, as well as from strategies used in other countries, and imaginative ideas of futuristic educators and others.

New designs for the comprehensive high school were developed in close collaboration with innovative, practicing teachers, administrators, and other support staff; state agency officials; teacher educators; policymakers; and community representatives to help insure that the prototypes would be strategic in view of the problems to be addressed and yet workable in practice. Without this pragmatic collaboration in the design process, the risk of mere wishful thinking and idealistic rhetoric would have been too great.

Primary Audience

The primary audience or market for the products of this project was to be school districts with opportunities to build new schools. Building and staffing a new school would permit full implementation of new designs without the typical barriers. A secondary market could be those school districts wishing to implement an alternative school (school within a school) or make a major transformation in an existing school. A tertiary market could be forward-looking school districts not yet sensing problems requiring action with their present high schools, but ever mindful of new possibilities.

In order to influence the identified markets within the constraints of available time and resources, the project focused on four target groups. These four groups were (1) research proposal writers in local and state agencies who are interested in reforming schools, (2) educational writers for the popular press, (3) other researchers supported by NCRVE who could incorporate new designs for high schools into future research and writing, and (4) the project design group who had ready access to the strategic organizations and agencies they represented. Through these groups the project was thought to have its best chance of influence. As it turned out, a fifth group that proved effective in dissemination of new design concepts was the writers of research and synthesis papers for each project phase.

Project Process

The project relied heavily on group process to advance through a series of closely connected phases. The phases were as follows:

Phase 1: Develop specifications for a learning signature.

Phase 2: Develop specifications for learner outcomes.

Phase 3: Develop specifications for the learning process (i.e., curriculum, instruction, assessment).

Phase 4: Develop specifications for organization and partnerships.

Phase 5: Develop specifications for staffing and a staff development program.

Phase 6: Develop specifications for desired learning environment (i.e., facilities, educational technology).

Phase 7: Develop cost specifications.

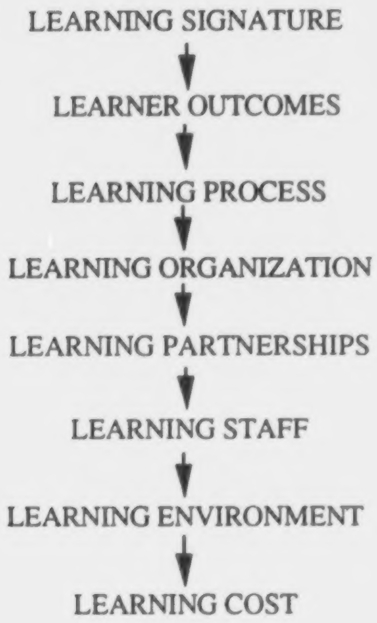
The phases were sequentially accomplished as listed. Phases 1 through 3 were completed during 1991, with the remaining phases done in 1992.

The design-down process insured that the learning signature and learner outcomes were *keystone* specifications from which all others were to be derived and rationalized. This strategy, shown in Figure 1, called into question all traditional assumptions about designing high schools which were not consistent with the design specifications of a prior phase. As it turned out, each phase was interactive with every new phase, bringing out additional perspectives and dimensions from previous phases. At times a previously drawn specification would be modified as new insights were gained.

The project proposal called for developing the new design specifications in close collaboration with practicing teachers, administrators, and other support staff; state education officials; teacher educators; policymakers; and community representatives. To implement this expectation, two strategies were used—an advisory design group with broad national representation, and focus groups selected for help with specific phases of the design.

Figure 1
Design-Down Process

DESIGNING DOWN


LEARNING SIGNATURE
LEARNER OUTCOMES
LEARNING PROCESS
LEARNING ORGANIZATION
LEARNING PARTNERSHIPS
LEARNING STAFF
LEARNING ENVIRONMENT
LEARNING COST

Design Group

The Design Group was selected after soliciting nominations for each of the categories of individuals to be represented among the group. Bright people who were quick studies on design problems and knowledgeable about schools and students were sought. They would be well-respected among the groups they represented and recognized for their leadership and commitment to improving schools for young people whether it be local, state, or national. The individuals making up the Design Group were

- Robert Bartman, Chief State School Officer, Missouri Department of Elementary and Secondary Education, Springfield, Missouri;
- Charles Benson, Director, National Center for Research in Vocational Education, University of California at Berkeley;
- Gene Bottoms, Southern Regional Education Board, Atlanta, Georgia;

- Diana Canales, teacher, Vocational English as a Second Language, Corpus Christi Independent School District, Corpus Christi, Texas;
- Paul Cole, Secretary-Treasurer, New York State AFL-CIO and Vice-President, American Federation of Teachers, Albany, New York;
- Edwin Espaillat, Vice-President, United Federation of Teachers and teacher, Aviation High School, New York, New York;
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- Mary Anne Raywid, Professor, Department of Administration and Policy Studies, Hofstra University, Hempstead, New York; and
- Walter Tobin, Superintendent, Orangeburg School District Five, Orangeburg, South Carolina.

The Design Group met six times during the course of the project. Five of the meetings were each two days in length with a final meeting of one day to review the project final report. A detailed summary of each meeting is available for review. The general meeting format included discussion of a set of key questions relating to the phase of the design process on the agenda; these are listed in Appendix A included in Volume 2 for each meeting. The Design Group was helpful in identifying concepts, individuals, and places that merited investigation during each phase. The Design Group's aim was to critically review the rationale for each phase's design specification and assist in developing consensus on those specifications. Consensus was defined as providing everyone with an opportunity to make their views known on an issue and adopting a set of design specifications everyone could accept.

Focus Groups

Focus groups, particularly involving people from school settings, were used to gather information about specific aspects of the design work. The focus group interview format established a set of leading questions. The process brought together a small group of individuals representing the interest group, guided a tape-recorded group interview, and resulted in a detailed interview analysis (Krueger, 1988). The American Federation of Teachers (AFT) helped us contact focus group participants in urban districts. The focus groups were the following:

- Learner outcomes—students and administrative staff, Rochester Public Schools, Rochester, Minnesota (a school district providing national leadership in implementing outcome-based education);
- Learning process—teachers, Los Angeles Public Schools, Los Angeles, California;
- Learning staff—students and administrative staff, South Cobb County Schools and Atlanta area public schools, Atlanta, Georgia;
- Learning environment—students and teachers, Detroit Public Schools, Detroit, Michigan.

The learning organization phase was informed by a school visit instead of a focus group. The Design Group visited Aviation High School in New York City and talked to the staff about the school's organizational design. In addition, NCRVE researchers who were working on projects related to secondary education met for two days to discuss their work and to identify implications for designing the new comprehensive high school. Formal reports describing the results of the first three focus group interviews and the conference of NCRVE researchers are available. Results of all focus group interviews and the conference of researchers were discussed by the Design Group. Focus group and conference reports are as follows:

- Bracewell, E. W. (1992). *The High Schools of Life? Perspectives of High School Administrators, Teachers, and Students from Rochester, Minnesota and Los Angeles, California*;
- Bracewell, E. W. (1992). *Staffing the High School of the Future: Perspectives from South Cobb County Comprehensive High School Teachers and Students, and Administrators from Greater Atlanta, Georgia*; and
- Holmes, C. S. (1992). *Invisible College Meeting—New Designs for the Comprehensive High School.*

Research and Synthesis Papers

Another major process was the development of a series of research and synthesis papers that aimed to summarize research and "best practice" relating to each phase of the project. These papers served as background for the Design Group meetings. The names of the primary author or authors are listed first. The research and synthesis papers are as follows (included in Volume 2, Appendices B through J):

- Pearce, K., Beck, R. H., Copa, G. H., and Pease, V. H. (1991). *Learner Outcomes: Past, Present, and Future*;
- Pease, V. H., Pearce, K., Copa, G. H., and Beck, R. H. (1991). *Learner Outcomes: Design Specifications and Selected Learner Outcomes for the Comprehensive High School of the Future—Choosing the Keystone*;
- Pearce, K., Pease, V. H., Copa, G. H., and Beck, R. H. (1991). *Learning Process: Interaction of Curriculum, Instruction, and Assessment in New Designs for the Comprehensive High School*;
- Pearce, K., Copa, G. H., Pease, V. H., and Beck, R. H. (1992). *Learning Organization: Reorganizing Learners, Learning Process, Settings, Time, and Staff in the Comprehensive High School*;

- Pease, V. H., and Copa, G. H. (1992). *Learning Decision Making: Specifications to Guide Processes in Future Comprehensive High Schools*;

- Karls, D. K., Pease, V. H., Copa, G. H., Beck, R. H., and Pearce, K. (1992). *Learning Partnerships: Lessons from Research Literature and Current Practice in Secondary Education*;

- Lum, B. J., Copa, G. H., and Pease, V. H. (1992). *Learning Staff: Conditions, Guidelines, and Desired Characteristics in New Designs for the Comprehensive High School*;

- Damyanovich, M., Copa, G. H., and Pease, V. H. (1992). *Learning Technology: Enhancing Learning in New Designs for the Comprehensive High School*;

- Jilk, B. A., Shields, J., Copa, G. H., and Pease, V. H. (1992). *Learning Environment: An Architectural Interpretations of a New Designs Archetype High School*; and

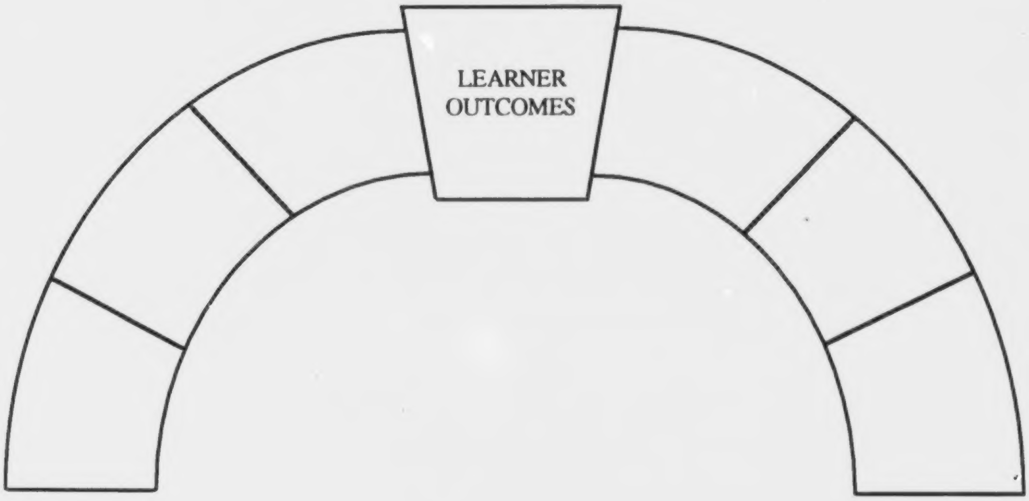
- Rickabaugh, J. R., Christie, C., Copa, G. H., and Pease, V. H. (1992). *Learning Costs: Operating Cost Analysis for the New Designs for the Comprehensive High School.*

In general, the process of writing a research and synthesis paper began by soliciting ideas from the Design Group regarding concepts, people, and places to be investigated; then, related research and best practices were reviewed and synthesized. When judged useful, a focus group to explore selected issues in more depth was convened. The research staff then selected the most useful information from the previous steps and discussed the results with the Design Group. Following these steps, the research and synthesis papers were revised and design specifications were drafted. Design specifications usually went through several drafts before they were finalized. The last activity for each phase was to develop a set of significant questions—called "smart questions"—that any school district designing a new school should ask itself concerning that phase.

Summary

The major purpose of this project was to develop well-founded, new designs for the comprehensive high school. Selecting a learning signature and a worthy set of learner outcomes was paramount in the design process; the learner outcomes serve as the keystone for other design components. The importance of the learner outcomes is graphically represented in Figure 2.

Figure 2
Learner Outcomes as the Keystone of the Design Process



With the learner outcomes as a keystone, a deliberate effort was made to design-down to components such as learning process, learning organization, learning partnerships, and so forth. What became apparent in this strategy was that the process being followed was as important as the resulting new design specifications. In essence, the Design Group realized each school system would need to go through this process for themselves, taking into consideration the design specifications and significant questions, while tailoring the final design to their own situation. The selection of learner outcomes, deliberate and disciplined designing-down, and the need to work through important questions in each specific school context are significant insights into school design resulting from this project.

Gaining Perspective

Two additional research and synthesis papers were prepared to provide a historical and international perspective for Design Group discussions and staff work. The papers were as follows (see Appendices L and M in Volume 2):

- Copa, G. H., and Pease, V. H. (1992). *The Comprehensive High School: A Historical Perspective*; and
- Donohue, T. R., Beck, R. H., Copa, G. H., and Pease, V. H. (1992). *The Comprehensive High School: An International Perspective.*

Historical Perspective

The purpose of the historical research and synthesis paper (presented in full in Appendix L of Volume 2) was to chart a brief history of the comprehensive high school in the United States and particularly to highlight the key decisions which made them what they are. We could see that design issues were sometimes not new; although issue resolution took different focuses at different times. The hope was that by keeping the past in mind, we would not naively reinvent old patterns of design that needed to be discarded.

In doing the historical review, the perspective taken was that the so-called comprehensive high schools we see on the American landscape are human productions fashioned after what was considered to be practical at the time. The practical considerations entering into their fashioning involved reaching for ideals and being realistic about operating constraints. They are people-made with a history exposing key decisions to make them what they are and not something else. The emphasis in the analysis was given to seemingly important national statements, decisions, and studies about comprehensive high schools.

The research and synthesis paper was developed through the use of historical analysis of the original writing relating to comprehensive high schools and secondary analyses of these writings. The review starts in the early 1600s and traces the comprehensive high school's development through the 1980s. The section titles in the paper give the following chronology of change-in-focus in these schools:

- 1600-1890 Getting started
- 1890-1920 Basic reform/social efficiency

- 1920-1940 Reorientation/being progressive
- 1940-1960 Reaction/subject centering
- 1960-1980 Relevance/equity
- 1980- Return to basics/excellence

Within each section, key statements, studies, decisions, and changes are mentioned along with analysis of their reasons, actors, and (where apparent) consequences. Following this section is an attempt to look across the years of development in terms of selected characteristics of the comprehensive high school—scope, purpose, curriculum, instruction, and leadership.

The first use of the term *comprehensive* in reference to the high school was by the Commission on Reorganization of Secondary Education appointed in 1913 by the National Education Association. It was used in reference to a school which embraced all curriculum in one unified organization. Earlier the terms *composite* and *cosmopolitan* seem to have a similar meaning. Later in the 1950s, John Gardner and James Conant would revisit the definition of a comprehensive high school suggesting it was to essentially serve all students from a given geographic area under one roof (or series of roofs) and have one administration. The comprehensive high school was characterized as a particularly American phenomenon in contrast to the specialized secondary schools in European educational systems.

A brief display of the historical analysis of the scope and purpose of comprehensive high schools in the United States is shown in Table 1. (The full analysis can be found in Appendix L.)

Table 1
Summary of Selected Characteristics of Comprehensive High School Development in the United States

	Year					
Characteristic	1600-1890	1890-1920	1920-1940	1940-1960	1960-1980	1980-
Size of population served	1600-1800: NA 1889-90: 359,949 (6.7% of age group)	1899-1900: 699,403 (11.4% of age group) 1909-1910: 1,115,398 (15.4% of age group) 1919-1920: 2,500,176 (32.3% of age group)	1929-1930: 4,804,255 (51.4% of age group) 1939-1940: 7,123,009 (73.3% of age group)	1949-1950: (76.8% of age group) 1959-1960: 9,590,000 (87.3% of age group)	1969-1970: 14,422,000 (92.7% of age group) 1979-1980: 16,327,000 (99.6% of age group)	
Purpose of secondary education	1600s: Prepare selected boys for college and to read the Bible (grammar school) 1750s: Prepare for success in life and business (academy) 1800s: Bridge from elementary school to college (high school)	1892: Prepare for life (same as prepare for college) 1913: Preserve, promote and refine the way of life in democracy 1935: Provide equal educational opportunity	1932: Prepare for social change but not reconstruction 1930: Preserve, promote, and refine the way of life in democracy 1935: Provide equal educational opportunity	1947: Equip to live in a democratic society; high school as custodian for all youth 1950s: Assist in competition with communist countries in science and national defense 1954: Prevent rigid social class barriers 1959: Search for intellectual talent among youth; provide general education for all and skills for immediate work or college education	1960s: Break poverty cycle; compensate for differences in earlier opportunity 1970s: Has too many purposes — overburdened; move to more specialized work; involve other institutions in providing education	Provide excellent education in basics; keep nation technically advanced

Note: High school student population in census year.

In terms of scope of operation, the growth in the number of high schools and the number of students served is staggering for the twentieth century. From 1900 to 1940 the number of students enrolled in high schools doubled every ten years; from 1940 to 1980 it doubled again. Think about the press for teachers, facilities, and curriculum materials with that expansion rate—from 700,000 students in 1900 to seven million in 1940 to fourteen million in 1980. Part of the increase was caused by serving a larger percent of the eligible age group—from eleven percent in 1900 to seventy-three percent in 1940 and up to ninety-nine percent in 1980. In 1910, the high school had an elite clientele, while in 1980 it was serving the masses. It is little wonder that the high school came to be known as comprehensive.

With regard to purpose, early in the development of the high school—and for that reason, perhaps most influential in its continued purpose and organization—the purpose of the high school was to prepare a relatively small elite group of students for efficient entry into higher education. Through the 1950s, several of the national commissions had as their major purpose to review ways to better articulate the relation between high school and college; the high school was assumed to be the institution needing to change.

In the 1930s, attention turned to education's role in social reconstruction and equal educational opportunity. Each generation was to have a fair and fresh start in the competition for benefit of society. In the 1950s, education was recognized for its role in assuring national purposes, that is, national defense and technological superiority. During the 1960s, the federal interest turned to the role of education in the War on Poverty. The purpose of education was becoming all encompassing; soon education was criticized as being aimless and not doing a very good job of anything. The 1980s high schools focused more on a limited set of subjects and a strategic role in international economic competition for the United States.

What became evident during the review was that many of the characteristics of comprehensive high schools often taken for granted (as given) might profitably be submitted to questioning—things did not always exist as they are today. Conscious decisions were made to make them the way they are. These decisions can be revisited to examine their reasons and whose interests were served, as well as intended and actual consequences. Consideration can be given to the appropriateness of these decisions for today's and future conditions.

International Perspective

The purpose of the international education research and synthesis paper (see Volume 2, Appendix M) was to learn what we could about the design of high schools in other countries in order to inform future designs of the comprehensive high school in the United States. Project co-directors Copa and Beck originally conceived the paper's general purpose and the comparative education approach; it benefited from Beck's considerable experience in international comparative education. Donohue was eventually employed to carry out the study. Six industrialized countries, illustrating a diverse, cross-section of school systems, were selected for comparison. They were Australia, the Federal Republic of Germany, France, Great Britain, Japan, and Sweden.

The findings of the paper suggest that despite abundant cultural, political, and economic differences, young adults in the United States and the six industrialized countries are increasingly faced with similar social dilemmas. Husen (1990) points out five commonalities: (1) urbanization, (2) changes in family structure and role of family, (3) increased competition in the world market and world economy, (4) increased value placed on formal education, and (5) slowing of the absorptive capacity of the labor market. The changes have shifted much of the responsibility for socialization of young people from the family to institutions such as the school.

Major national school reform initiatives in the six countries were of primary interest. A literature search and telephone calls to the country's embassy sought information on learner outcomes, learning processes, staffing, organization and management, partnerships, facilities, and cost. A concise, across-the-board comparison of important features from the six countries is shown in Table 2. Key words and phrases are used to represent what appeared to be most important in each country. Visually, the table allows for comparisons between countries and the United States (assumed to be familiar to the reader), and clearly illuminate areas where information may be lacking.

Table 2
Main Themes of Secondary Education Reform in Six Countries

	COUNTRY					
FOCUS	**Australia**	**Germany**	**France**	**Japan**	**Sweden**	**Great Britain**
Learner Outcomes	• Development of potential in individual • Satisfaction of workforce needs	• Socially responsible citizens • Equality of opportunity • Well trained, productive workforce • Independence	• Equality of opportunity • Satisfaction of workforce needs • Full development of personality	• Full development of personality • Responsibility • Respect • Flexibility	• Socially responsible citizens • Balanced individuals • Skill development for entering workforce	• Quality skills and knowledge • Adaptability • Reasoning abilities
Learning Process (Curriculum, Instruction, Assessment)	• New emphasis: basic skills, continuity of curriculum, and expansion of subjects • State assessment	• Three core fields, plus options • State assessment • Numerical grading (1-5) • Written reports, conferences	• National curriculum • Assessment by commissions • Differing assessment among schools	• National curriculum & texts (some flexibility) • Juku • Credit system • Reward for effort & participation	• Centrally framed core curriculum • thirty+ lines of study • Numerical grading (1-5) • No exams/parent conference	• New national curriculum = entitlement • nine foundation subjects + religion and foreign language • Performance-based assessment
Organization and Management	• Coeducational/ comprehensive • Decentralized	• Dual system • Vocational and Academic • Rigorous selection to academic secondary	• Comprehensive • Highly centralized	• Centralized • Competitive exam for secondary school • Unofficial ranking of schools	• Centralized • Secondary school application	• Centralized curriculum • Local management • Public or grant maintained • Emphasis on school choice
Partnerships with Community	• Work-oriented programs: achievement, experience, and inquiry	• Strength of system = smooth transition from school to work • Government and industry cooperation • Apprenticeship	• Short or long technical education programs • Technical education = last resort • Mission Locales		• Youth Guarantee: ensures job or school for 16 to 18 year-olds • Work experience is focal point in upper secondary	• Youth Training Scheme = training + work experience = vocational qualifications • Technical & vocational education initiative = industry + community

Table 2 (cont.)

FOCUS	Australia	Germany	France	Japan	Sweden	Great Britain
Staffing	• Members of community and industry employed in work-oriented programs	• Well respected • High salary • Tenure	• National recruitment • Competitive exam	• Well respected • Moral guide • Powerful union • High salary		
Physical Facilities				• Simple, functional		• Peaceful, comfortable, no security needs
Cost		• Shared by industry, labor, and schools	• Minimal cost, financial aid available	• Free compulsory schooling • Fee for upper secondary school	• Sizeable investment by central government	• Free market competition for enrollments • Professional fund raisers employed
Future Focus	• Transition to work — linkages	• Environmental awareness education • Women in science and industry	• Training for work • Educational linkages to work	• Lifelong learning • Individuality • Flexibility • Global view		• Refining assessment techniques for performance-based assessment

A more complete description and analysis of Table 2 appears in the research and synthesis paper (see Appendix M). The international education comparison was summarized in the form of conclusions and suggestions applicable to new designs for the comprehensive high school. The major summary points were as follows:

- The recurrent theme among countries was a closer relationship between secondary schooling and the world of work. National governments look to education as the key to economic competitiveness and national cohesion. Youth are considered an important human resource and critical to the workforce of the future.
- It seems imperative that youth be given a clearly defined route to meaningful employment and/or further education. In most countries examined, individuals are informed about the options and guided through the system.
- The view that education must have relevance to the world beyond the classroom was evident on a worldwide scale and fundamental to sustaining the broad support of parents and the motivation of students.

The comparative study yielded several suggestions for the redesign of the comprehensive high school in the United States. They were the following:

- The responsibility for school-to-work transition should be shared by national and state governments, industry, schools, and local communities. Collaborative and cooperative effort can best sustain a variety of programs to serve a diverse population of students.
- Despite the current emphasis on technical and skill training, these should not replace other components of a sound general education. As in Japan, a holistic education should be emphasized for all students.
- Group participation and cooperative learning are increasingly important. Placing less emphasis on the individual accomplishments may serve to encourage learning and strengthen bonds among students. This approach to teaching and learning may be more compatible with the cultural traditions of many minority groups within the United States.
- Effort and participation, rather than ability, should be rewarded.

- The role of the teacher should expand beyond the classroom, and teachers should be rewarded for attending to the extra demands.

- Performance-based assessments are beneficial in the evaluation of general skills needed in today's workforce.

- Members of the community and industry should be encouraged to utilize their expertise in a related school staff role.

- Schools can provide for a broader range of social services (i.e., job service, work experience programs, housing services, health, and counseling services).

- School should play a facilitative role in promoting cross-cultural understanding.

The historical and international perspectives for secondary schools helped the Design Group and research staff to ask critical questions and press for sound, innovative answers regarding the design of high schools. The broader perspective made it less likely that the past would unknowingly be recreated.

LEARNING SIGNATURE

There is considerable research (Hill, Foster, & Gendler, 1990; Mitchell, Russell, & Benson, 1989) to suggest that high schools with focus or special character are more effective on a number of fronts. The focus or special character of a school provides an identity for students to rally around, talk about, and share. This special character was mentioned several times by high school students in focus group interviews as being very important to them in achieving a sense of belonging. Focus or character can also give the school staff a sense of coherence to many otherwise seemingly unrelated dimensions of the school. In this project, the school's focus or character was called a learning signature.

Developing a Learning Signature

In developing the notion of a learning signature, the Design Group initially reviewed former Secretary of Education William Bennett's (Rothman, 1988) conception of the ideal school, James Madison High School, which had been given the signature of the former United States president and statesman. It is interesting to note that since that time, others have proposed design templates for "Franklin High Schools" by Sizer (1992) and "Edison Project Schools" by the Whittle group (Walsh, 1992).

At the first meeting of the Design Group, each member was asked to propose a signature for their ideal high school. The signature could have been in the form of a person, picture, or set of words. One signature suggested earlier by Charles Benson and Paul Cole was that of Leonardo da Vinci High School, which would highlight the integration of vocational and academic studies and accomplishments. Other ideas included a one-room country school house, [illegible] of leadership, a school for all students, America's School of Hope, a school fo[illegible] of giftedness and talents, soaring eagle, the student who needed the most help, sunrise, the grin of justified self-confidence, and a flagship institution. No attempt was made at this point to force consensus on one signature. However, as discussion ensued, the idea of using Leonardo da Vinci as a signature declined in favor—even though he represented many positive features of the school—because he was white, male, and Western in orientation, and, thereby, could possibly exclude attention to several large segments of the student body of most high schools.

At the second meeting of the Design Group, attention again returned to the signature. After reviewing the discussion from the previous meeting, Design Group members were asked to again propose a signature for the comprehensive high school. This time they were asked to put their proposed signature on a whiteboard in the form of words or pictures. The ideas that emerged included the following:

- enterprises
- schools for hope
- high schools that work
- schools that adapt to people ("my way")
- da Vinci's symbol on a keystone
- "trust learning" over a globe
- ethos of specialness and high expectations

- diversity is a national treasure
- together-achievement-success
- overlapping rings
- a burning torch
- enterprises of the mind
- eagle at the top of an arch with spread wings and interlocking rings
- something that "flies close to the sun but doesn't end in tragedy"
- a circle that closes when technical and academic are brought together
- world class for all

Discussion then turned to the meaning and rationale behind each proposed signature, common features, and troubling aspects. It was left to the project staff to come forward at the next meeting with a signature proposal.

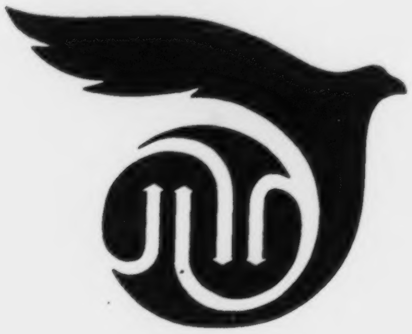
The learning signature proposed by the project staff at the next meeting was that of a learning community to communicate a vision of a school with a strong sense of community. The characteristics of community (Raywid, 1988) include interaction and mutual dependence, intention of permanence, expressive ties, communication, common and mutual sentiments, shared beliefs, and an ethic of individual concern and sympathy. These characteristics seemed to resonate with the proposed signatures and related discussions of the Design Group members. The signature of a learning community brought with it a sense of place, of individual identity, and of group solidarity essential to realizing full human potential through learning.

However, while the Design Group endorsed the learning community as a signature, they felt it still was missing some unique aspects of the high school they envisioned. These missing aspects included the essential ideas of the integration of vocational and academic curriculums in the high school and the need for a school capable of undergoing several, as yet, undetermined transformations.

Adopted Signature

With these ideas in mind, the project staff again was asked to continue its work and come forward with another more encompassing signature. At this point, the project staff turned to a graphic artist to develop a visual concept of a signature that expressed the special qualities of the hoped for designs, including (1) the learning community, (2) the integration of vocational and academic education, and (3) the capacity to undergo transformation. The signature selected is shown in Figure 3.

Figure 3
Learning Signature:
New Designs for the Comprehensive High School



The arrows represent the coming together of all partners in a community of learning as well as the vocational and academic components of the curriculum in an enriched general education. The necessity of coming together is represented by the position of the arrows—the actual form of the result of coming together is yet to be worked out by the involved partners. The arrows are also to represent the transformation(s) now before us in comprehensive high schools. The bird represents the comprehensive high school graduate with education tucked under its wing, confident to commence what life has in store for the future.

Design Specifications

Based on research and discussions, the Design Group selected the following specifications as important in designing a learning signature for a new comprehensive high school. The learning signature should do the following:

- give specialness and character to the school,
- give focus and coherence to all components of the school,
- powerfully communicate the vision for the school,
- be easily and clearly understood by all stakeholders in the school,
- not exclude any students, and
- represent a consensus vision of stakeholders for the school.

LEARNER OUTCOMES*

At certain times or in particular places, the high school is harmonious with its community, has a clear purpose, and provides a demanding—yet caring—environment. In the most desirable circumstances, comprehensive high schools offer all secondary students from a particular geographic region a map and a choice of routes so that each student is able to select an educational program that encourages competence for the transition to postsecondary experiences (i.e., work, military, family life, community service, college). In actuality, clarity of purpose and goals sometimes have been obscured and overshadowed by uninformed choices through a shopping mall approach to educational offerings. A lack of relevance to students' lives also sometimes manifests itself through "compromises" between students and school staff.

The very nature of being comprehensive sometimes discourages the development of a discernible focus for the high school's educational programs. When this happens, developing the aims and objectives of education for the comprehensive high school becomes particularly problematic. For those reasons, the Design Group believes that the desired learner outcomes should help define the focus by providing intellectually and morally sound statements of the purposes of schooling for the important stakeholders of the high school.

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* This section summarizes two research and synthesis papers. They are Pearce, Beck, Copa, and Pease (1991) *Learner Outcomes: Past, Present, and Future* and Pease, Pearce, Copa, and Beck (1991) *Learner Outcomes: Design Specifications and Selected Learner Outcomes for the Comprehensive High School of the Future—Choosing the Keystone* (see Appendices B and C).

Highlights from Research and Practice

Historically, words such as purposes, aims, goals, objectives, requirements, and outcomes have been used to define the role of education either from an outcome or input perspective, or as a means/end process. Words using the outcome perspective require demonstration by students; words using an input perspective define what the student should be taught. Words using a means/end process point the way, which, in some cases, may never be reached.

A century ago, in 1893, the National Education Association's Committee of Ten attempted to define comprehensive goals for the high school. They stressed "mental discipline" and recommended that the high school curriculum include English, mathematics, history, the sciences, Latin, and other foreign languages—a strict academic curriculum for all students. Preparation for higher education, the committee argued, was the best preparation for life (Boyer, 1983, p. 49). It was an input perspective.

Another National Education Association committee, the Commission on the Reorganization of Secondary Education (1918), published the results of their five-year study of the purposes of secondary education in *Cardinal Principles of Education*. The commission recognized that objectives could and must be acquired through multiple subject areas. However, the subject areas must be reorganized so they could contribute to the achievement of the objectives of education. They listed principles of the following: health, command of fundamental processes (reading, writing, arithmetic, and oral and written expression), worthy home membership, vocation, citizenship, worthy use of leisure time, and ethical character. The seven Cardinal Principles expressed an outcome perspective.

John Dewey (1916) responded to the efforts to describe specific objectives of education in *Democracy and Education*. He stated that it is futile to identify one aim when rather there are several general aims "all consistent with one another" (p. 111). The aims of education, according to Dewey, change with the "needs of the contemporary situation" (p. 111). He believed that "a given generation tends to emphasize in its conscious projections just the things which it has least of in actual fact" (p. 112). Consequently, aims of education will change as the needs of society change. Dewey identified three general aims of education:

1. Natural development that focused on health, vigor, physical mobility, and differences among people;
2. Social efficiency that translated into industrial competence and good citizenship; and
3. Culture that included "appreciation of ideas and art and broad human interests." (p. 121)

He also believed that aims, partially stated, "come in conflict with one another" (p. 123) and, only when they are integrated, are they consistent with one another.

"A Study of Schooling" in *A Place Called School* by Goodlad (1984), included an examination of mission statements and learning objectives from high schools in states and districts throughout the United States. It brought together the purposes of school that are common to the United States' experience and the developmental needs of students. According to Goodlad, the purposes of school have changed little over the past one-hundred years. Generally, the purposes have been to help students pursue their vocational goals; academic goals; social, civic, and cultural goals; and personal goals. He also noted that vague, unclear, poorly written goals and objectives are largely ignored by teachers, principals, and students.

In the past decade, outcome-based education (OBE) has been widely studied and discussed, and currently a dozen or more states are moving through legislation in the direction of OBE. The OBE model has matured and evolved as a result of use, as have some of the OBE pioneers.

Spady and Marshall (1991, 1992) attempted to move beyond traditional OBE by combining the means-end perspective with the input-outcomes perspective. They refer to their newer set of principles as transformational OBE. As they describe it, transformational OBE is the

> highest evolution of the OBE concept, . . . [and] its implications for curriculum design and the structuring of schools is profound. It fully embraces and embodies the spirit and substance of the four OBE principles. It is grounded on the question: Why do schools exist in this day and age? The transformational OBE answer to this question is bold: "To equip all students with the knowledge, competence, and orientations needed for

> success after they leave school." Hence, its guiding vision of the graduate is that of competent future citizen. (1991, p. 70)

Transformational OBE takes the stance that none of the current educational traditions are sacred. Each must be examined as it benefits students, in light of the projections and beliefs about students' future roles.

The North Carolina Department of Public Instruction (1992) and four school districts have joined other transformational OBE pioneers such as the U.S. Department of Defense Dependent School in the Mediterranean Region, Aurora Public Schools in Aurora, Colorado, and Hot Springs County School District in Thermopolis, Wyoming (Spady & Marshall, 1992, pp. 17-18), which are testing design models. They are using outcomes and values that focus on the future life context and roles that students are expected to assume. This future-driven development process is called "transformational strategic design." In the process, five key questions have been applied in order to define the future roles and life context for students:

1. In what spheres and contexts of living will students need to function effectively now and to be successful in the future?

2. What are the significant problems–challenges–opportunities that are likely to exist within each of these respective spheres that students will have to anticipate, address, and solve?

3. What significant, value-added life-role performances will students have to carry out in order to successfully anticipate, address, and solve the problems–challenges–opportunities they will encounter in each of these spheres of living?

4. What enabling role-performance competencies must be established for students to be able to perform these life-roles successfully?

5. What content/concepts and information/ideas must they assimilate and apply in order for these life-role competencies to be realized?

As a result of this process, it is envisioned that twenty-first century individuals will have seven important characteristics. They will be (1) confident and competent individuals; (2) self-directed learners; (3) complex thinkers; (4) supportive persons; (5) contributing citizens within local, national, and global contexts; (6) cooperative team members; and (7) quality producers (North Carolina Department of Instruction, 1992).

Transformational outcomes are under development in school communities across the United States. During the development process, they will be refined by the public processes of hearings and pilot testing at actual school sites. In the future, other districts and school design groups may consider such lists for adoption in the school design experience.

Design Specifications

The Design Group deliberated at their first meeting about the purpose and desired outcomes of the comprehensive high school for the twenty-first century. The following design specifications were established as useful for making the decision. Learner outcomes should

- be described in no more than one-half of a standard printed page. A short list has some opportunity to present a clear focus and direction to educators;
- focus on the customers of the school;
- be able to survive tests of legitimacy from the stakeholders in the school;
- represent balanced attention to all areas of human talent and development;
- involve reaching for a meaning of educational excellence that provides challenge and opportunity, perhaps beyond present grasp; and
- convey the belief that the outcomes represent goals for *all* students.

Selected Learner Outcomes

At the first stage of the design process, the Design Group decided to use the secondary learner outcomes developed by the Minnesota Department of Education (1991). The Design Group recognized that the list is not transformational; it is, rather, more transitional (Spady & Marshall, 1992). The outcomes were more timid than the Design

Group would have liked and not as clearly linked to the future life-roles and context of students as would have been desired. Yet, the list had survived a rigorous and disciplined process of development in relation to the above design specifications. It became apparent to the Design Group that the process of communities working together to define their outcomes is as important as the outcomes generated. Early in 1991, when the Design Group first met, the following list felt like a solid beginning:

> In order to lead productive fulfilling lives in a complex and changing society and to continue learning:
>
> The graduate shall demonstrate the knowledge, skills, and attitudes essential to:
>
> 1. communicate with words, numbers, visuals, symbols, and sounds;
> 2. think and solve problems to meet personal, social, and academic needs;
> 3. contribute as a citizen in local, state, national, and global communities;
> 4. understand diversity and the interdependence of people;
> 5. work cooperatively in groups and independently;
> 6. develop physical and emotional well-being; and
> 7. contribute to the economic well-being of society.
>
> (Minnesota Department of Education, 1991)

Our society and economy requires progressively higher levels of skill and knowledge. These learner outcomes must be implemented with an awareness that the tools used in life are constantly changing. Basic technological literacy in areas such as computer operations, databases, and electronic communications are becoming basic skill requirements. The need to deal with human diversity and to integrate information and services has moved us all beyond a point where we can work in isolation as specialists. School curricula must place greater emphasis on group processes, interpersonal communication, teamwork, multiple languages, problem solving, critical thinking, and basic competence with key technologies. Schools are likely to have more success teaching these skills by changing the process of learning as well as the content of education.

LEARNING PROCESS*

Designs for the comprehensive high school must address the learning process from the perspective that all students need to achieve the learner outcomes described in the previous section of this report. However, since students differ in a multitude of characteristics, including life goals, backgrounds, personalities, and learning styles, the learning process must also flexibly serve each student in order for individuals to reach common learner outcomes.

As used in this report, the *learning process* includes curriculum, assessment, and instruction. Curriculum refers to the subject matter to be learned in order to achieve the learner outcomes. Subject matter includes knowledge, skills, and dispositions leading to the learner outcomes. Instruction means the strategies used to learn the subject matter. Assessment refers to the means used to appraise if—and demonstrate that—learning is progressing toward learner outcomes. Although the concepts of curriculum, instruction, and assessment are defined separately above, they are very difficult to separate in practice. Rather, they are integrated and interactive.

Highlights from Research and Practice

According to the work on OBE (outcome-based education) by Spady (1988), it is essential that the learning process be designed down from learner outcomes. And, this means that closely interrelated and mutually reinforcing curriculum, assessment, and instruction need to be developed from the learner outcomes. As noted in the previous section, the aim in learner outcome development is to ensure that the outcomes are designed down from the problems, challenges, and continuing concerns students now and in the future will face (Spady & Marshall, 1991, 1992). Therefore, the curriculum, assessment, and instruction must be designed relative to present and anticipated life experiences of students.

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* Pearce, Pease, Copa, and Beck (1991) *Learning Process: Interaction of Curriculum, Instruction, and Assessment in New Designs for the Comprehensive High School* provides the research and synthesis for this section on learning process (see Appendix D).

Curriculum

The curriculum must have this relevancy, as researchers Thomas (1992), Berryman (1988), and Resnick (1987) ascertained. They point to the need for much more focus on how learning is stimulated and facilitated (i.e., the learning process) within more fixed aims as to what is to be learned (i.e., the learner outcomes). And, they highlight a key need: diminish the existing gap between schoolwork and life outside of school. The dimensions of this shearing gap includes the individualization of schoolwork versus teamwork and competition for grades versus cooperation outside of school; the use of clearly defined learning problems in schoolwork versus ill-defined problems outside of school; and the primacy of books as a learning resource in schoolwork versus use of multiple resources outside of school.

For example, the Secretary's Commission on Achieving Necessary Skills (SCANS) (1991) identifies three foundation skills and five competencies that all students need as they go into the workplace or on to school. The five competencies include the abilities (1) to identify, organize, plan, and allocate resources; (2) to work with others; (3) to acquire and use information; (4) to understand complex systems; and (5) to work with a variety of technologies. The SCANS Report recommends that the competencies and foundations be injected "into every nook and cranny of the school curriculum" (p. ix). According to the report, students currently see little connection between what they do in school and what they will do to earn a living. Therefore, the authors of the SCANS Report believe that "teachers and schools must begin early to help students see the relationships between what they study and its applications in real-world contexts" (p. 19). These recommendations call for a curriculum which is much more related to the active and experiential life of students.

Assessment

As another component of the learning process, assessment needs to move beyond standardized scores and paper-and-pencil achievement tests to portfolios, products of projects, and more-realistic performance demonstrations. The National Center on Effective Secondary Schools (NCESS) (1987) suggests that assessments meet the following criteria: (1) Did the student succeed in meeting the educational goal?; (2) What does the assessment say about how the student, teacher, or school might improve?; and (3) Can or should the assessment provide comparative judgments or rankings of student performance?

In addition, the NCESS (1987) notes that one fundamental issue needs to be addressed during assessment: Does the information collected represent an accurate estimate of significant knowledge or mastery? They state specifically,

> Tests have been criticized especially for their failure to measure competence as expressed in "real life" situations beyond school, especially as people speak and write to one another, as they try to comprehend the written word, and as they try to solve mechanical, biological, and civic problems. (p. 1)

In the context of work, SCANS (1991) recommends that the assessment process "must be designed so that, when teachers teach and students study, both are engaged in authentic practice of valued competencies" (p. 29). SCANS further recommends that assessment measure "mastery of specific, learnable competencies" (p. 30) that become part of a student's credentials.

Sizer (1992) suggests that the answers to two questions will throw a shadow backwards and thereby provide direction to both curriculum and assessment. The questions to ask are "What is it that the best kids do?; How do they use what we give them?; and What do we admire in our best graduates?" (p. 21). Sizer goes on to recommend that students should be required to *exhibit* their control of the material, their mastery of the material, and their ability to use the material. He suggests that the eighteenth century Academy notion of *exhibition* or performance be used to assess youngsters. Archbald and Newmann (1987) appear to agree with Sizer in noting that

> A useful and valid assessment system must not only provide information about the actual type and quality of competence that students have achieved; it must also base its assessment on achievement considered significant, meaningful and authentic. (p. 5)

Authentic achievement has value for two reasons, according to Newmann (1990). First, participation in authentic tasks is a motivator for students because it has value beyond school. Second, it allows the use of higher-order thinking and problem-solving capacities. He suggests that students need to engage much more often in "long-term projects which result in discourse, things, and performances of interest to students, their peers and the public at large" (p. 4).

Wiggins (1991) discusses something similar to authentic achievement when he talks about establishing standards that are evaluated by "necessarily varied student products and performances" (p. 19). He comments that standards need to be established and students need to be given progress reports regarding how close they are to meeting the standards. Wiggins believes that one purpose of assessment is to provide a guiding picture of the student's movement toward a real standard. In this regard, he notes that vocational programs, athletic departments, art, music, and debate classes already use real standards.

Instruction

Turning last to instruction, advocates of OBE argue that a wide variety of learning strategies and support systems need to be available if all students are to learn the prescribed learner outcomes. The assumption is that you can learn the same thing in a variety of ways with a flexible time schedule. On another dimension, Adler (1982) concludes that "all genuine learning is active, not passive. It involves the use of the mind, not just the memory. It is a process of delivery in which the student is the main agent, not the teacher" (p. 50).

Design Specifications

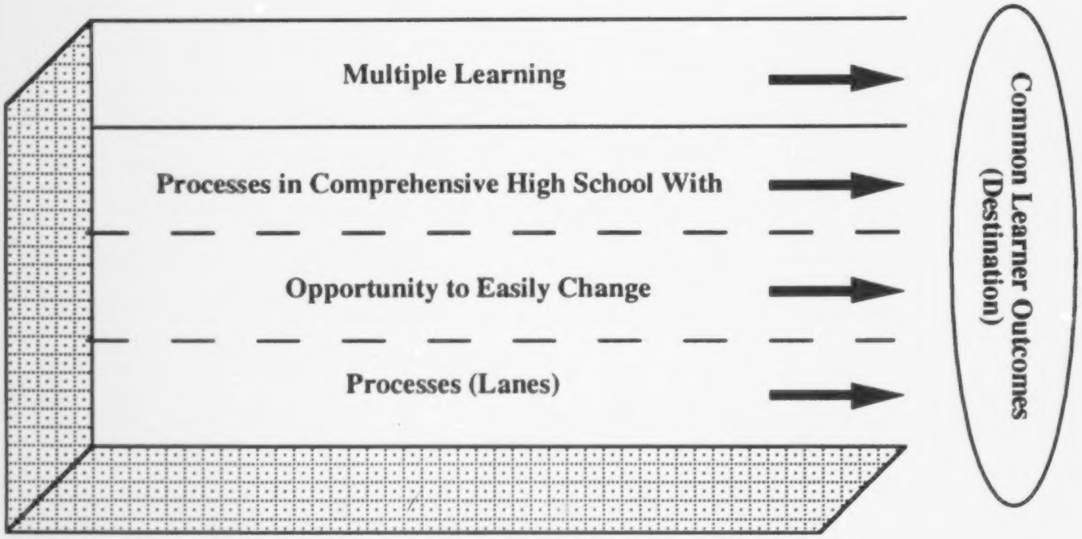
The learning process, as conceived in this project, can be envisioned as a "multi-lane highway or freeway," as shown in Figure 4, which is comprehensive in terms of both serving the needs of young people with a full range of characteristics and in terms of preparing for the full range of life roles and responsibilities. Students would be moving along this highway toward common learner outcomes with rigorous and firm standards. What we would have here is the same expectations for all students and multiple opportunities or pathways to reach these expectations.

Each of the "lanes" represents a different context for learning as a means to enhance motivation, engagement, and meaning, and could involve different content, methods, and assessments. The lanes are not for students with different ability levels. To the contrary, each lane should attract students with a full range of abilities, and, more important, ability as a student attribute should diminish as students strive for common learner outcomes and beyond. Students would be able to easily "change lanes" as they plan and execute their own pathways in the light of their changing needs and interests; there would be no penalty for changing lanes.

Undergirding the "roadbed of learning lanes" is a highly unified and reinforced foundation of vocational and academic education. Solid academic and modern vocational education in a closely integrated and interactive format are a part of the common education for all students with this conception of the learning process.

Figure 4

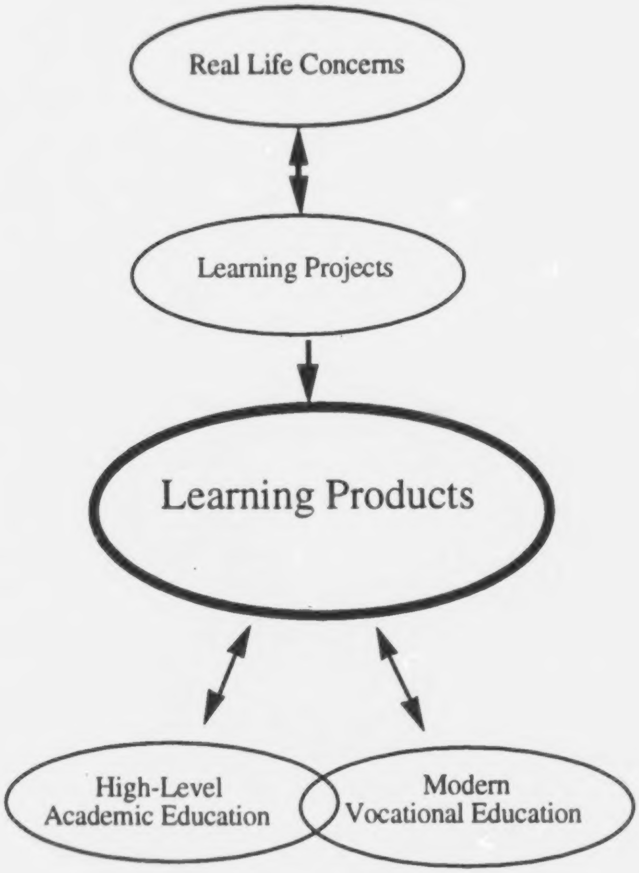
Integration and Interrelation of High-Level Academic and Modern Vocational Education as Foundation for Reaching Common Learner Outcomes Through Multiple Learning Processes


Multiple Learning
Processes in Comprehensive High School With
Opportunity to Easily Change
Processes (Lanes)
Common Learner Outcomes
(Destination)

Integrated and Interrelated High-Level Academic and Modern Vocational Education as Foundation (Roadbed)

Further, learning projects and products are a central part of the learning process in the school, as depicted in Figure 5. In cooperation with students, authentic projects are selected from the life challenges and opportunities students face now or are likely to face in the future in their family, work, and community lives. Projects form the context for integrating vocational and academic education and make learning relevant and engaging. Through the learning projects, all students are challenged to develop high level thinking and problem-solving skills resulting in learning projects. Learning projects serve to demonstrate and exhibit competence to meet learner outcomes—there is the expectation to learn to know and apply.

Figure 5
Learning Products as a Way to Integrate, Apply, and Demonstrate Learning


Real Life Concerns
Learning Projects
Learning Products
High-Level Academic Education
Modern Vocational Education

With these ideas in mind, the specifications for new designs for the comprehensive high school are as follows:

- The learning process is aligned with learner outcomes.
- Curriculum, assessment, and instruction should be aligned with each other within the learning process.

- The learning process should be relevant to the life experience of the student.
- The learning process should be personalized to each student.
- The learning process should be active and experiential for each student.
- The learning process should be freeing and empowering for each student.
- The learning process should be rigorous for each student.
- The learning process should create a feeling of community among students.

LEARNING ORGANIZATION[*]

Focus group research provided direction to the Design Group for the organizational phase of the project. In the open atmosphere of a focus group, high school staff members shared their hopes and experiences. From Los Angeles to New York City, staff members who have experienced change in their high schools indicated that the watershed of restructuring is the school's organization. Schools that have been willing to relinquish the traditional organization of learners, processes, settings, time, and staff have turned toward alternative organizational structures.

At least five features of the high school need attention as to organization. Appropriate strategies for organizing learners include those which expand the opportunities now available for students in small schools and those which provide more personalized groupings in large schools. As a way to expand and personalize learning opportunities, other educational settings needing consideration include those to be found in the home, the workplace, the community, and other schools (elementary through postsecondary). The organization of the learning processes should emphasize integrated curriculum directed toward demonstrated achievements and equitable participation. The learning time in an outcome-based environment should be flexibly scheduled and should encourage extended engagement with more complex material and issues. Staffing should be done in relation to learner outcomes to be achieved and the learning processes to be used. Organization of staff should also facilitate the development of staffs' talents and interests.

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[*] The research and synthesis paper on learning organization is Pearce, Copa, Pease, and Beck (1992) *Learning Organization: Reorganizing Learners, Learning Process, Settings, Time, and Staff in the Comprehensive High School* (see Appendix E).

Highlights from Research and Practice

Different organizational structures alone assure nothing, according to Newmann (1991), the head of the Center for School Reorganization and Change at the University of Wisconsin at Madison. He says that restructuring should be premised on "an agenda of powerful content. . . . [It] should concentrate on a curriculum of in-depth understanding and authentic learning; success for all students; teachers functioning in new roles; and schools as moral communities" (p. 17).

Powerful content was represented by the idea of learner outcomes as keystone and the multiple lanes of the learning process that enable all students to achieve the outcomes. A rich and thorough discussion of powerful, integrated vocational and academic content appeared in earlier project publications by Beck (1990a, 1990b, 1991); Beck, Copa, and Pease (1991); Copa (1992); and Copa and Tebbenhoff (1990). These accounts lay the foundation for a general education that integrates the high status academic curriculum and the modern vocational curriculum. The results of research by Bottoms (1992) and Crain, Heebner, Si, Jordan, and Kiefer (1992) indicates that all high school students are capable of mastering high-status academic curriculum if the material is presented using multiple strategies and contexts and takes advantage of multiple options for organization.

The ways in which the various options for organizing schools come together makes a great deal of difference in the outcomes and learning processes, according to evidence from practitioners and research from comprehensive, vocational, academic, and alternative high schools. Alignment and coherence between elements are the keys.

Learners

Learners should be organized into smaller groups—referred to here as families and neighborhoods—within their learning community. The Design Group recommended that learners should be organized according to common interests, long-term group projects, or some other expressed choice. Organization structures could be the house plan, career paths, or the school-within-a-school. Organization according to a vocational–academic stratification was not recommended. This latter type of secondary design—often swayed by perceived ability level, social background, or race—has resulted in inequitable educational opportunities according to Oakes (1992); Oakes and Lipton (1990); Oakes, Selvin, Karoly, and Guiton (1992); Raizen (1989); Copa and Tebbenhoff (1990); Plihal, Johnson, Bentley, Morgaine, and Liang (1992); and Beck (1990a).

Learning Settings

In addition to the home high school as a learning setting, other community settings can be brought into the school organization. Partnerships and state policy are structures to accomplish this goal. Learning opportunities can be extended in other schools: (1) colleges; (2) area vocational schools (McDonnell & Grubb, 1991); (3) state schools; (4) secondary choice options, including career-oriented comprehensive schools, and community colleges; (5) area learning centers; and (6) alternative schools.

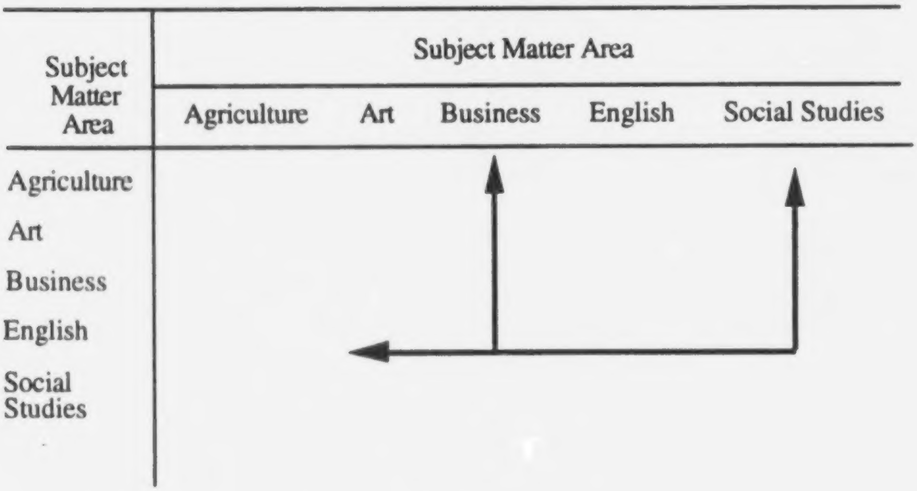
Places of paid and unpaid work also provide learning settings that "weave the fabric of learning at school and work" (National Alliance of Business, 1992, p. 24) as alternative contexts that improve learning. Currently, cooperative vocational education is the main high school program in which paid work and school are combined in the United States (U.S. Department of Education, 1991). Other promising approaches include the youth apprenticeship approach of the 1991 legislation in Oregon and Wisconsin, school-based enterprises, Tech Prep, vocational academies, and "second-chance" programs for dropouts (Bragg, 1992; Council of Chief State School Officers, 1992; Stern, Crain, Stone, Hopkins, & McMillion, 1992; Stone, Hopkins, Stern, & McMillion, 1991). Service learning, whether mandatory (as in Maryland) or voluntary, is another example of active, experiential learning that depends upon unpaid work in community settings (Cairn & Kielsmeier, 1991).

Learning Processes

Integrated curriculum and structured work experience can positively reinforce each other. Five reasons for organizing the learning process and settings with an integrated curriculum are commonly expressed. These reasons are the following: (1) political (e.g., requirement for Carl D. Perkins Vocational and Technology Education Act of 1990), (2) cognitive (National Council on Vocational Education, 1990-91; Raizen, 1989), (3) meaningfulness, (4) outcome-based standards, and (5) equity (Oakes, 1992; Plihal et al., 1992; Selvin, Oakes, Hare, Ramsey, & Schoeff, 1990).

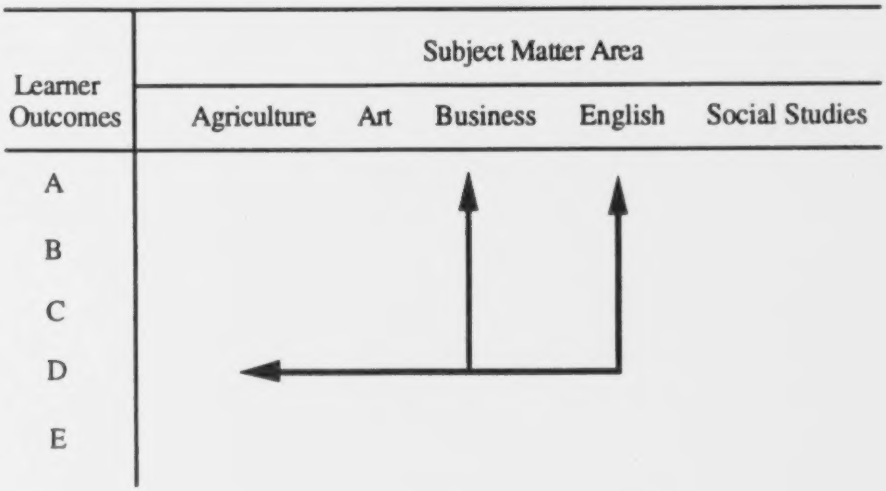
The most common conception of the integration of subject matter areas in the high school is shown in Figure 6. Here the subject matter areas, both vocational and academic, interact and relate one to the other in many combinations to form the organization of the content of learning. Examples of this form of content organization are described in Beck, Copa, and Pease (1991).

Figure 6
Organizing the Learning Process to Integrate the Subject Matter Areas


Subject Matter Area
Subject Matter Area
Agriculture
Art
Business
English
Social Studies
Agriculture
Art
Business
English
Social Studies

However, with an outcome-based learning approach, the integration of subject matter areas takes on a different focus as shown in Figure 7. Learning content is organized so that areas relate to one another in serving to reach common learner outcomes for all students. And, the same learner outcomes can be reached through different combinations of subject matter areas.

Figure 7
Organizing the Learning Process to Integrate the Subject Matter Areas to Reach Common Learner Outcomes



Explicit curriculum integration of vocational and academic education under the Perkins Act of 1990 is too new to evaluate for outcomes, but impressive gains in academic achievement test scores were seen in pilot high schools from the Southern Regional Education Board (SREB)–StateVocational Education Consortium. The SREB Consortium is made up of eighty-seven high schools in nineteen states. These schools are integrating the essential content from high status college preparatory studies—English, mathematics, and science—with modern vocational studies. The recommended program of study includes the following: at least four credits in a vocational area with two being related vocational credits; three credits in mathematics with two being equivalent to Algebra I or higher level; three credits in science with two being equivalent to college preparatory science courses; and four credits in college preparatory English. In 1990, twenty-one percent of vocational completers who completed the recommended curriculum had the National Assessment of Educational Progress (NAEP) mathematics, science, and reading scores that significantly exceeded SREB goals and the national average, according to Bottoms (1992).

The SREB results fit the pattern cited by Vars (1991). He reports that efforts to integrate the curriculum have a long history. Since 1942, more than eighty normative or specific houses. Another house plan assigned a small core of teachers and partially organized support staff around each house. A third school assigned students to class-size groups which met with a teacher coordinator for one period a day. No other support or teaching staff were assigned to the students. Because staff outside of the school building are involved in the organization of learning, technology will be essential in establishing the interpersonal communication network under any organizational plan.

Design Specifications

The organizational elements include the learners, processes, settings, time, and staff. The recommended specifications are as follows:

- Organizational elements are aligned with the signature, outcomes, learning processes, and among themselves.
- Organization should be responsive to the individual learning plans of the student population. Students should be involved in the planning process that leads to a flexible learning plan that is periodically reviewed.
- As a way to build community and maximize motivation and achievement, internal groupings of students in large schools should be limited; groups of 250 to 500 are recommended. Smaller groups should maintain links to large groups.
- Students should be grouped according to interests, projects, and expressed choices when this serves learner, process, or time needs.
- Curriculum should be organized in a manner that encourages and allows integration of the separate discipline areas. It may be possible to organize curriculum by outcomes or by areas of social development.
- Learning time should be flexibly scheduled to encourage and support learner outcomes through a variety of learning strategies and to allow a concentrated effort when appropriate.
- Learning settings should extend into the community through partnerships and policy.

comparative studies have reviewed the effectiveness of integrative programs. Results show that "in nearly every instance, students in various types of integrative-interdisciplinary programs have performed as well or better on standardized tests than students enrolled in the usual separate subjects" (p. 15).

Learning Time

Much of the discussion about outcome-based learning focuses on the axiom that learning should be the constant and time the variable. Flexible time schedules can be provided in several ways. Carroll's *The Copernican Plan* (1990) includes a macro scheduling plan for extended classes including one four-hour class each day for thirty days and two two-hour classes each day for sixty days. Students study the same subject for extended periods of time and are able to get into the more complex issues that surround the subject.

Sizer's (1992) principles for the Coalition of Essential Schools recognizes the need for time flexibility. He recommends that "time served" and "credits earned" disappear as criterion for performance. In the "Essential Schools," time is to be structured in accordance with the central priorities which are (1) time in class, (2) time for community service, and (3) time for teachers to plan individually and to work with colleagues and partners.

Learning Staff

The learning staff, along with the learning time, should be uncoupled from the Carnegie Unit. Instead, the staff needs an organization that recognizes special talents and encourages staff interaction and innovation (Beck, Copa, & Pease, 1991). Boyer (1983) and Sizer (1992) agree that this might be accomplished if all teachers have one period per day to meet together.

Alternative student-staff organizations should be considered in context with other design specifications. According to Oxley (1990), different house plans are staffed in varied ways. Ideally, a house plan would provide teachers for the core subject matter, sufficient social service support to meet personal needs and an organization coordinator. More loosely connected house plans organize the staff accordingly. For example, Oxley describes one house plan which was organized by providing a full complement of support staff—deans, counselors, family assistants—to each house but did not assign teachers to

- Staff should be connected to students in ways that provide maximum opportunities to focus or to change direction as students move toward completion of high school.

LEARNING DECISION MAKING*

Comprehensive high schools try to serve multiple purposes and many constituent groups. Seven control elements are among those that most influence the decision making through formal school governance. These elements are (1) demographic, (2) legal, (3) structural, (4) ideational, (5) knowledge, (6) financial, and (7) network. As a result of responding to these inside and outside elements, schools tend to operate under many rules rather than a few guiding specifications. Over time, the rules and comfortable traditions create inertia (Campbell, Cunningham, Nystrand, & Usdan, 1990).

New Designs high schools should expect to be operating in ways that serve their own particular learning communities; the rules and traditions that are expected of traditional comprehensive high schools may not completely serve their purposes. The project's proposed set of design specifications will create some difficulty in maintaining the status quo for learner outcomes, learning process, or the patterns of organization and partnerships. People and the organization will be changing and growing because of the interaction of subject matter and people in the learning community. This design needs to be guided by a newer vision of decision-making processes that will counteract inertia and accommodate continuous growth and transition.

Highlights from Research and Practice

Bolman and Deal (1991) point out in *Reframing Organizations* that organizations are complex, surprisingly deceptive, and ambiguous. Based upon their study of educational and business organizations, the types of decisions that are made in the redesign process include (1) decisions on meaning (e.g., political, human, structural); (2) decisions of standards (e.g., external, customers, internal); (3) decisions on timing (e.g., when, for whom, how intensive); (4) decisions on resources (e.g., acquisition, use, distribution); (5) decisions about organization (e.g., which functions need tight standards, which functions will thrive on loose organization); and (6) decisions on motivation (e.g., buy-in, ownership, compliance, directive).

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* The paper by Pease and Copa (1992), *Learning Decision Making: Specifications to Guide Processes in Future Comprehensive High Schools*, explains more fully the specifications for decision making (see Appendix F).

Decisions that were made in this research project were brought under the discipline of the design-down process which is often associated with OBE systems (Spady, 1988). Decisions were made for each phase (i.e., learner outcomes, learning processes, learning organization and partnerships, learning staff, learning environment, and costs). Other design teams may develop other typologies. For example, in the final report of the redesign committee for the fictional Franklin High School (Sizer, 1992), the design specifications were organized by beliefs, basic design, curriculum, exhibitions, structures, and practicalities.

Approaches to Decision Making

Studies of exemplary vocational schools (Mitchell et al., 1989; Wardlow, Swanson, Caskey, & Migler, 1991; Wardlow, Swanson, & Migler, 1992) and focused schools (Hill & Bonan, 1991; Hill et al., 1990) showed that decisions were often made at the site. School staff were involved in issues that affected the quality of the program. Following this lead, the project staff reviewed decision-making models that are considered to be more collaborative in nature, site-based, aimed toward improvement, and currently in use in public schools.

The literature from business enterprises and labor organizations that were moving in the direction of employee participation and high-performance, quality outcomes was also synthesized. Total quality management (Deming, 1986; Schmidt & Finnigan, 1992) and high performance work systems with self-directed work teams (Marshall, 1991; Packer & Wirt, 1991; SCANS, 1992; Senge, 1990) provided a wealth of information about the decision-making processes in these environments.

In the context of New Designs high schools, the nature of decisive authority and participation becomes clearer. "Focused schools are not democracies" (Hill et al., 1990, p. 39). Rather, they are more like tight-loose organizations; day-to-day decisions are made by open discussion and negotiation, but the prior agreement on the focus of the school constrains the arguments, provides a grounds for the resolution of disagreements, and establishes the boundaries of debate.

Decision-making approaches, with an emphasis on local decision making by team members, should facilitate the ongoing operation and continuous improvement of a new designs learning environment. Decision-making participants are able to pay attention to an aim or mission, and they are familiar with the specific context of the problem situations, involved individuals, and resources in organizations. Decisions and processes will tend to be timely and informed by adequate and accurate information. Data-rich environments enhance the abilities of self-diagnosis and self-correction. They also keep the focus on opportunities or alternatives and the consequences and evaluation of the proposed implementations. Decision-making processes that appear to be effective in settings for a high performance work team and where continuous improvement is the path to quality seemed to be based on practical reasoning.

Decision Making to Support Practical Reasoning

Copa (1992) explains that practical reasoning is particularly useful for solving the problems which arise in the course of everyday life, including school life. Practical reasoning is a systematic, reflective process requiring deliberation (often with others) and using a variety of kinds of knowledge such as facts, interpretations, and values. The elements of practical reasoning include the following:

- determining aims or desired state of affairs
- studying and interpreting contextual information
- developing alternative actions
- evaluating consequences
- making judgments
- taking actions
- evaluating and monitoring action

Practical reasoning requires attention to the process of resolution and its results, both what and how things will be done. The process is relational because it involves open conversation with others. The process is normative because it seeks value standards resulting in the greatest good. If practical reasoning is used reflectively and systematically, it provides a framework and process that can successfully deal with the complexity and challenge of practical problems.

Good Decisions

The Design Group was interested in good decision-making processes. "Good" has many individual meanings, but the Group felt there was consensus that good began with the expectations and meaning communicated in learner outcomes, but reached for the ideals represented by the school's signature. Good decisions and processes would help "educate students to live in a multi-cultural world, to face the challenge of reconciling differences and community, and to address what it means to have a voice in shaping one's future" (Giroux, 1992, p. 7). They would be based upon the "discourse of ethics" as well as the "rules of management and efficiency" (p. 7). Good decision-making processes reflect both the vision and the values of the organization and involve all of the stakeholders.

Design Specifications

The following design specifications regarding decision-making processes in new designs for the comprehensive high school are recommended:

- Decisions should be deeply rooted in and aligned with the signature and learner outcomes of the high school.
- Decision making should begin as close to the problem at hand as possible and yet consider the short- and long-term consequences of action for those near and further removed from the problem.
- Decisions should make things better for all students, not just for some.
- Decision making should encompass the voices of staff, students, partners, and the broader community.
- Decision making still should be authoritative, not necessarily democratic, and recognize that authority is vested unequally.
- Decision making should have access to the rich resources of all of the school's partners.

- Decision making should be "yes-based" rather than "no-based"; it should assume waivers or variances are already under local control or will be granted by the controlling agency.

- Decisions should be transitional between traditional and progressive ways of acting.

LEARNING PARTNERSHIPS*

Considering the breadth of expectations proposed in the learner outcomes and the specifications that the learning process be relevant to real life, be active and experiential, and be emancipative and rigorous, the Design Group found that it was necessary to look beyond the traditional school boundaries and bell schedules for catalysts and resources in new designs for the comprehensive school. Some of the catalysts and resources needed are naturally occurring in the community surrounding the high school. That community includes the family, business and industry, community-based organizations, and other schools (preschool through postsecondary). These entities represent essential partners for new high school designs.

Highlights from Research and Practice

The term partnership is used to label a wide variety of relationships among two or more entities. In this report, *partnership* will be used to refer to relationships in which there is (1) some level of cooperative effort among the partners; (2) a shared goal, vision, or enterprise; (3) mutual respect and trust among the partners; (4) contribution of talents, experiences, perspectives, and resources from each partner; (5) shared power among the partnership; and (6) shared accountability for what the partnership plans to accomplish. In this context, the purpose of the partnership is ultimately to enhance achievement of learner outcomes for all students. The partnerships represent the infrastructure to assist in this purpose.

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* A thorough review and synthesis of the literature on partnerships is found in Karls, Pease, Copa, Beck, and Pearce (1992) *Learning Partnerships: Lessons from Research Literature and Current Practice in Secondary Education* (see Appendix G).

As noted, a variety of terms are used to label partnership activities (i.e., cooperation, network, linkage, collaboration, consortium, coalition, and alliance). To assist in thinking about partnerships more clearly and precisely, other researchers have considered educational partnerships from the perspective of intensity, motivation, and commodity of exchange. Maurice (1984) developed a classification for partnerships based on the level or intensity of the association for educational purposes among the partners. The levels of association, from lowest to highest, are (1) separation—no information or resources are shared and each organization maintains its own sphere of authority; (2) communication—the school seeks information and advice from its educational partner, or vise versa, yet each still maintains separate spheres of authority; (3) cooperation—the educational partner is involved in the learning process and provides resources; (4) collaboration—the possible educational contributions of each partner are considered, programs link the partners, no effort is made to modify either organization to accommodate mutual objectives; and (5) integration—structures within cooperating organizations are modified to accommodate the objectives, a joint sphere of authority exists to accomplish the mutual objectives, resources are merged, and responsibility for success or failure is shared. The partnerships the Design Group have in mind for new high school designs are of the more intense kind, labeled as collaboration and integration.

Turning to the motivation for participation in the teaching and learning process, Jones and Maloy (1988) have classified motives for partnerships as "obliged to," "ought to," and "want to." According to these authors, "obliged to" conveys top-down pressure for organizational partnership such as a court order, funding conditions, or state policy requirements. "Ought to" prevails where leaders sense their organizations will benefit from partnerships in some as yet undetermined way. "Want to" describes the response of those members of organizations who anticipate personal and professional gains from their involvement in proposed activities. The aim here is to establish partnerships motivated on a "want to/want to" basis.

The National Alliance of Business (1987) examined thousands of education-related partnerships in the United States and categorized them on the basis of the commodity being shared or the type of assistance being given. The categories, from highest impact to lowest impact, were the following: (1) partners in policy, (2) partners in systematic educational improvement, (3) partners in management, (4) partners in professional development, (5) partners in the classroom, and (6) partners in special services. The National Alliance of

Business suggests that each category, from bottom (special services) to top (policy), represents an increasing amount of business involvement and investment and an increasing impact on the high school. A telling point made by the Alliance is that most partnerships start at lower amounts of involvement and gradually develop to the higher levels.

Learning Partners for the High School

The high school has a multitude of potential partners in the learning process. Four groups of learning partners are highlighted here: (1) parents and families, (2) community-based organizations, (3) business and industry, and (4) other schools.

Parents and Families

Parents and families as partners with the high school can significantly affect student learning. Cavazos (1989) suggests that parent involvement takes several forms: (1) involvement within the context of the home, as parents and other family members encourage their children and exhibit a positive attitude toward learning in the school; (2) involvement in the role parents take in relationship to the school and school system, ranging from volunteer work in the classroom to school governance; and (3) involvement by the parents' choice of schools their children will attend. Partnerships with parents need to change as children develop different needs. Important needs of young people during the later adolescent years are as follows: (1) being able to do something important, (2) having meaningful involvements, (3) having freedom to make choices, (4) forming values or a system of beliefs that fosters commitment, (5) gaining status in an adult world, and (6) selecting and preparing for an occupation (Mitchell, 1986).

Community-Based Organizations

Community-based organizations as partners include human service agencies, churches and religious groups, and civic organizations. The challenge for schools is to join forces with these organizations so all students may learn responsibility and citizenship. One of the common partnership activities with community-based organizations is what the Search Institute (Benson, 1990) calls prosocial behavior. Prosocial behavior covers a wide range of human actions—helping people in distress; donating time or energy to volunteer service organizations; and attempting to reverse political, economic, and social injustice or inequality. The common thread among these behaviors is the desire or intent to promote the welfare of others.

The community service or service-learning movement is a good example of partnerships between the high school and community-based organizations. The work of the National Youth Leadership Council (Cairn & Kielsmeier, 1991) has been helpful in identifying curricula and other resources to promote youth service in community organizations. Locating human services in schools for easy access by students is another common form of partnership between schools and community-based organizations.

Business and Industry

Business and industry partnerships with the high school are becoming increasingly frequent. Cetron and Gayle (1991) cite the National Center for Education Statistics, which shows more than 140,000 business/education partnerships sponsored by industry and foundations. More than forty percent of elementary and high schools participated in business partnerships. By the year 2000, this percentage is predicted to reach one-hundred percent. The Conference Board (1991) points out several new directions in school/ business partnerships including more emphasis on improved learner outcomes and learning process, increased attention to accountability and evaluation, and shift from fiscal independence to co-location of services.

Other Schools

Other schools as partners includes the full range of school levels from preschool to elementary and junior high schools, other high schools, and postsecondary schools. Elementary and junior high schools are natural partners with high schools in that they supply the high school with its students. Partnerships between these schools often involve the following: (1) curriculum scope and sequence efforts among grades K–12; (2) career exploration in junior high schools as preparation for high school course selection; and (3) opportunities for elementary and junior high school students to achieve the basic skills necessary for high school study.

Partnerships with technical or community colleges and universities are also key relationships that allow all students to reach the learner outcomes. Tech Prep arrangements such as the 2 + 2 model, Minnesota's Options program, and College in the Schools programs are examples of such relationships. Some of the important reasons for high school/postsecondary school partnerships that are cited in the literature include the following: (1) improved efficiency and effectiveness of educational institutions at these levels; (2) helping students make smooth transitions from one level of school to another; (3) eliminating delay, duplication of courses, or loss of credit; (4) helping students accomplish the same educational goals in a shorter time; and (5) facilitating higher accomplishment in the same time.

Design Specifications

Based on a review of related research and best practices and discussions by the Design Group, the following design specifications regarding partnerships are recommended:

- Partnership efforts should aim toward developing collaborative and interactive partnerships.
- Partnership efforts should aim toward "want to/want to" motivation among partners.
- Partnerships should strive for mutual respect and trust among partners.
- Partnerships should build the ability of partners to bridge different institutional cultures.
- Partnerships should set realistic and clearly stated expectations for the partnership.
- Partnerships should employ good program practices as a means to sustain and improve the partnership.

LEARNING STAFF[*]

The principles guiding the new designs for the comprehensive high school all come to bear as one considers the initial staffing needs and the staff development required to continually improve the proposed designs. *Staffing* refers to everyone directly involved in the learning process, as well as those in supporting roles from janitor to secretary to bus driver to food service provider to parent volunteer to administrator to school board member.

Designing-Down

The design-down process means that the design specifications in all previous components of the design—learning signature, learner outcomes, learning process, learning organization, learning partnerships, learning decision making—need to be taken into consideration. The design specifications relating to learning organization, partnerships, and decision making have particularly significant implications for thinking about staffing and staff development. Integration of vocational and academic education calls for teamwork and interdisciplinary knowledge on the part of all staff. Additionally, the focus on the learning community implies a close and interchanging relationship among teachers and learners and between the school and the wider community (Schmidt, 1992).

Shift to Relational Staffing

As one considers staffing implications, all of these changes taken together suggest a major paradigm shift in the notion of learner and learning in the New Designs schools. The movement is to include multiple world views and ways of knowing and increased attention to the interpretive and critical science views in contrast to the positivistic view. For example, concern with learner outcomes encompasses the projected view of an educated person, an educated person's relationship with other persons, attitude toward society, and the dynamics that underlie these relationships instead of an unbalanced emphasis on technical academic skills.

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[*] Summary of Lum, Copa, and Pease (1992) *Learning Staff: Conditions, Guidelines, and Desired Characteristics in New Designs for the Comprehensive High School* (see Appendix H).

Within the curriculum component of the learning process, the shift is from a conceptualization of subject matter as existing independently and separately among the many disciplines and offering a fragmented knowledge about the world, to a highly integrated curriculum with interdisciplinary subject matter that combines and coordinates disciplinary perspectives. "Comprehensive" takes on new meaning in the sense that gaining human knowledge and understanding is not taken as a cognitive activity of gathering facts and accumulating information, but as an integrative process that involves conceptual planning and reflection on the representational aspects and interpretive nature of course content. The construction of the curriculum is meaning-driven, context-sensitive, and value-ridden.

Instructional methods that involve collaborative team efforts among teachers, as well as cooperative learning and shared educative practice among students, are considered more desirable than excessive focus on individualized relationships between student learner and adult teacher. Teachers become facilitators while students take on responsible new roles as peer teachers and teaching assistants. Less emphasis on discipline as a primary method of classroom management and more emphasis on student interest is seen as the motivating force for engaging in learning activities. The recognition of multiple intelligences and learning style differences demand a variety of instructional approaches (Wardlow et al., 1992).

Assessment is appropriately developed in line with envisioned student outcomes, the curriculum subject matter being taught, and the specifically designed instructional methods to both achieve learner outcomes and accommodate subject matter. Assessment is not regarded as an evaluative tool for discrediting either student or teacher performance but, rather, as an evaluative tool that can be part of the reflective learning process. Assessment, then, becomes integral to the improvement of instructional practices.

Shift in Organization and Partnerships

Shifting notions of the organization of the institution surround issues about social principles of democracy and the relationship of the individual to the whole. Not only are we concerned with the overall structure of the school organization, but the collective values that it represents. The institutionalized norms that guide the functioning habits of its members and the ways in which the organizational rules are established to maximize a fair distribution of responsibilities and benefits to its membership also must be considered.

The nature of relationships between schools and partners in the external community also needs rethinking. Each partner's motivations, needs, and postures taken in joint ventures need to be considered. The traditional posture taken by schools often follows the service delivery model, whereby the school reacts to the demands of the outside agent. The partnership model the Design Group has in mind sees parents, business and industry, community-based organizations, and other schools all playing a much more active and responsible part in the educative process, the shaping of the curriculum, and the commitment to lifelong learning by students. What holds partnerships between schools and outside organizations together are shared ideas and joint teaching practices, as well as a sense of collective responsibility for students' future lives as member citizens of society.

Design Specifications

Based on the design-down process, review of related research, and the deliberations of the Design Group, the following design specifications are recommended for staffing and staff development:

- Individually or collectively, staff should exhibit character qualities and conduct that are set as expectations of high school graduates.
- Staff should understand how to look at curriculum, assessment, and instruction work as an integrated whole to achieve learner outcomes.
- Staff should know how to construct, research, develop, and write interdisciplinary and integrated curriculum that addresses learner outcomes.
- Staff should know how to use a variety of methods, strategies, and instructional techniques and understand their appropriate fit to curriculum and aim of particular lessons. Classroom management should use learning styles, instructional tools, and motivation that reflect the values expressed in learner outcomes. Staff should work together cooperatively and collaboratively as teams in the delivery of interdisciplinary and integrated curriculum.
- Staff should know how to develop forms of assessment that account for curriculum content, evaluate the effectiveness of instructional methods, and account for both individualized and collective learner outcomes. Staff must understand how forms

of assessment are self-reflective tools for understanding and enhancement of their own craft, as well as ways of monitoring the developmental process and student outcomes.

- Staff should reflect the ability to occupy and carry out multiple and alternating roles in which collaborative decision making is the operational norm.

- Staff should be willing to work actively to create opportunities in which the community can become involved in the learning process. Staff should have knowledge, skill, and experience with community partnerships in the area of learning for which they have responsibility. Staff should include members of the community who participate in the learning process both inside and outside the school.

- Staff development should include all staff participating in the learning processes and be consistent with other design specifications for the school.

LEARNING TECHNOLOGY*

The high technology transformation of schools that many predicted a decade ago has not materialized. Looking around a typical high school today one would see little changed from the early 1980s. Educators are quick to point out the barriers to widespread use of technology (i.e., high costs of purchase and maintenance, dearth of appropriate software, lack of teacher training). Some observers believe problems with educational use of technology have as much to do with organizational politics as silicon chips (Sheingold & Tucker, 1990).

There is ample evidence that the common practice of simply adding technology can not achieve changes without modification of the other dimensions of school. However, where stakeholders are redefining what goes on within classrooms and school and rethinking the way teachers teach and students learn, new technology is demonstrating a key facilitative role in the transformation process (Pearlman, 1991).

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* This section is thoroughly developed in Damyanovich, Copa, and Pease (1992) *Learning Technology: Enhancing Learning in New Designs for the Comprehensive High School* (see Appendix I).

In this report, *learning technology* refers to the new and emerging information technologies that connect people and institutions and provide easy access to multiple sources and forms of information at disparate locations, making learning accessible, flexible, and portable. Computers, calculators, electronic networks, telecommunications, database, graphics and publishing software, videodisc, CD-ROM, and interactive and satellite television all are technologies that can be put to educational use.

Highlights from Research and Practice

In the 1990s, two forces are changing both the process of education and the notion of school. These are the revolution in information technology and the policy initiatives which grant school choice to consumers. Learning is no longer confined to school. Cable television networks such as *Discovery* and *The Learning Channel*, how-to videos, and home computers are initial learning sources made possible through technology. Whittle's *Edison Project* (Walsh, 1992) and other private vendors now on the drawing boards, promise a superior education at reduced cost through technology utilization. The comprehensive high school, in order to survive, will need to consider the implication of moves from paper-text to hyper-text and from monopoly to marketplace.

Learning Community

The most important benefits technology can bring to the learning community are venue and opportunity for interaction, collaboration, and information exchange. A *backbone* of local area networks (LAN) and telecommunications make this possible. When they are merged, learners potentially have instant access to any information source anywhere in the world or in their community. Through technology, the school becomes a vital meeting place for a host of community services. Telephones, voice mail, and electronic mail (E-mail) can enhance student-to-student, teacher-to-student, and teacher-to-teacher communication.

Electronic networks also extend the community of caring adults to the high school learners. When community is of primary concern, telecommunications offer students valuable links with social, commercial, governmental, cultural, and education resources. Students are able to initiate on-line forums on community issues or provide access to electronic information services for family or neighbors who do not otherwise have convenient or informed access. Extended relationships with community adults can be developed on-line; currently, relationships between students and other adults outside of the school are often limited to brief field-trip encounters.

Outcomes and Technology

In an outcome-based education (OBE) system, students use technology tools both to facilitate and to demonstrate their attainment of the learning. Learner outcomes directly represent the knowledge, skills, and attitudes needed by positive, contributing adults. Students must engage in worthwhile, significant, and meaningful learning in an environment that closely resembles the environment in which they will be expected to perform as adults. This suggests that students will need access to the tools-for-knowing and tools-for-doing that are routinely used by adults in an increasingly complex and changing world. The challenge is to engage students in skillful use of these tools as learning resources.

Learning Process

Technology catalyzes the learning processes in several ways. First, the tools of multimedia technology encourage authentic achievement because they tap the use of multiple intelligences and reach all of the senses. Next, multimedia tools can be matched to the learning styles of individuals, including the disabled. Many tools are specially designed to help disabled learners operate computers using modified input devices like nonstandard keyboard or voice-activated switches. Finally, technology promotes a sense of ownership when learners actually create their understandings and, in the act of creating, become active and experiential learners.

The learning environment of this New Designs school allows collaborative, project-based learning to occur naturally. In many ways, this type of learning work is similar to real-time homes, work, and communities. Collaborative, project-oriented education quickly transgresses formal academic boundaries so integrated curriculum becomes the norm. Integrated courses might begin when vocational and academic teachers sit down together to plan a program, course, or unit. For example, involvement in multimedia productions like "Foxfire" on family, video community almanacs, or international telecommunication projects with an Antarctic expedition require performance activities that are authentic rather than contrived.

Assessment of the learning process tells students, teachers, administrators, and the community what is important in school. Authentic assessments look for results that are richer than grades. Computer-based personal learning plans (PLP) can be used to collect, organize, and present student portfolio information. They can include actual samples of oral, written, and graphic work. Students can use the PLP to evaluate their own progress and format the presentation of their learning projects.

Organization and Partnerships

Learning technology has the capacity to make learning time truly flexible and eliminate the confusion of prerequisite and curriculum tracks. Instructional learning systems (ILS) can offer the opportunity for independent learning apart from the classroom. An ILS is a hardware/software system in which students' computers are networked to a central server loaded with curriculum software and an integrated management system (IMS). Examples of systems that are currently available are Computer System Research (CSR), WICAT System, Computer Curriculum Corporation (CCC), Josten Learning Corporation, International Business Machines (IBM), and WASATCH Education Systems.

When an instructional learning system is combined with distance learning technologies, the opportunity to change learning direction and focus increases. Satellite and two-way interactive television are two distance-education technologies that bring instruction to the learner. While the common use today brings instruction into rural school buildings, tomorrow it can bring instruction to learners in other community settings.

Learning technology is a community investment and will encourage active participation by the learning partners in postsecondary institutions, businesses, homes, and in the community. Partners can actively help plan, acquire, maintain, staff, and use the technology. Through partnerships, the community as a whole benefits from the closer ties. Public access cable television stations are a current example of mutual benefit.

Technology–Zoned Environment

Adult and student workers will need a multiplicity of spaces such as open areas, small cubicles designed for five to ten participants, larger gathering places, and a number of individual and independent learning places. Because there is no one best way to enable their learning work, several *space-plus-technology zones* could be provided. These zones might include seminar rooms for small group interaction in which technology is limited to whiteboards for sketching ideas and concepts; production areas containing networked computers with shared peripherals; large workrooms with several multimedia production stations and desktop publishing workstations; and a learner bank stocked with high technology tools and equipment that is for loan. In instruction areas, various media (i.e., telephone, CD-ROM, computer projection equipment) are integrated and controlled by the presenter from a computer-driven console.

Cost

The cost of learning technology for New Designs schools will be considered in the context of local needs assessments. Some of the technologies can be expensive; today, ILS, satellite, and two-way interactive television are in that category. However, many of the technologies are already relatively inexpensive or available through partnerships and negotiated agreements. When cost is considered in relation to the other design specifications for the school, it is suspected that older-style media, production, and communication costs (printed library volumes and textbooks, storage space and recycling, printing equipment) will be less used and technology can capture those resources.

Design Specifications

If the design specifications for the new comprehensive high school are to be realized, technology must be directed to each of the parts, which collectively give shape and direction to the school and are viewed as an ecosystem. The specifications for these key parts will define the specifications for technology. All learners, students, and staff should be able to do the following:

- Access the same personal productivity tools used to increase the effectiveness and efficiency of adults in the workplace, home, and community.
- Access multimedia tools for information retrieval, manipulation, knowledge production, and presentation.
- Use an installed, backbone network providing access to almost any station on the network and to resources beyond the school through telecommunications.

- Use an open, interactive, distributed, IMS designed for monitoring alignment of curriculum, assessment, and instruction and student performance tracking.
- Use a management system that helps students, parents, and teachers work together to develop and manage the PLP.
- Access multimedia tools and a LAN merged to worldwide, telecommunication networks.
- Use an installed satellite and/or two way interactive television and an installed computer-based ILS if justified by a needs assessment process.
- Share the common goals and responsibility of learning technology with learning partners in the school and community.
- Work with technology in a multiplicity of zoned spaces such as open areas, small cubicles designed for up to five participants, larger gathering places, and a number of individual and independent learning places.
- Participate in the technology needs assessment.

LEARNING ENVIRONMENT*

Altering the public's image of school facilities may be the single most difficult part of the needed transformation in American education. The public must somehow come to see that it is possible, important, and necessary not only to transform school, but to design learning facilities that differ sharply from the traditional school facilities of the past.

Learning takes place in many different settings. Increasingly, the success of the school as a *place for learning* depends on its ability to create and support learning opportunities. These opportunities occur both within a school facility and beyond its walls. Therefore, the school must reinforce the linkage to other settings and strengthen the bonds between the school and the greater community. It must become a *learning environment.*

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*A complete description, set of drawings, and support materials appear in Jilk, Shields, Copa, and Pease (1992) *Learning Environment: Architectural Interpretations of New Designs for the Comprehensive High School* (see Appendix J).

It has been suggested by some authorities that all learning ought to occur without places called "school." Although this is an alternative, the concept of a comprehensive high school benefits from having a place for learning in the following ways:

- The school, as a place, is a symbol of hope.
- The school as a central place can be the broker for sending youngsters to and from real-world experiences.
- The school can be a place for the socialization of youth.
- The school can be a place where real-world experiences are synthesized, analyzed, and understood by the pupils.
- The school can be an amenable place for exploring self.
- The school can be a safe place when the individual's welfare is at risk.

When students learn outside the place called school, the more likely it will be that they will be able to humanize the place called school (Weinstock, 1973).

The traditional high school design is strongly determined by the Carnegie Unit. The number, size, and location of classrooms are a result of efficiently grouping and moving students so they may accumulate their time units. OBE totally changes this focus. OBE affects school pedagogy, governance, calendar, curriculum, assessment, accountability, learning technology, and partnerships.

An Archetype

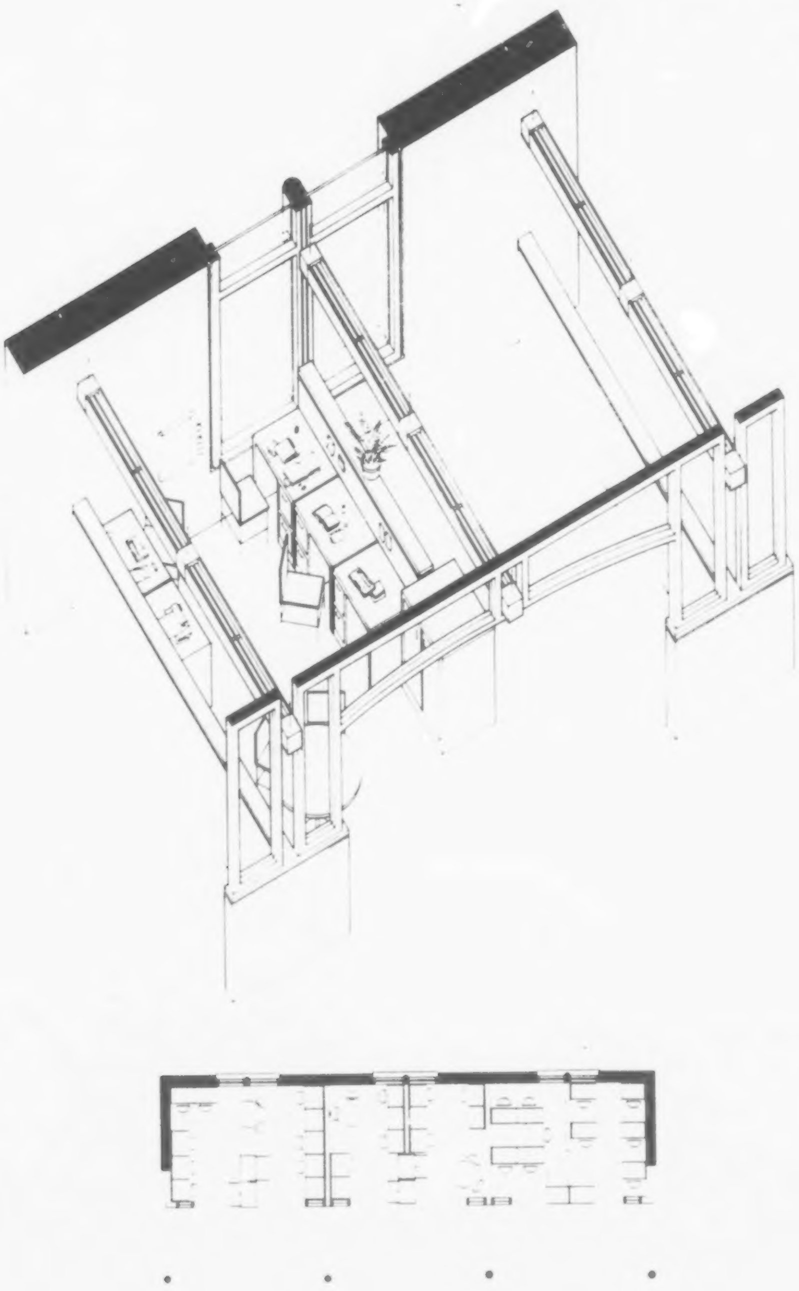
An archetype of a high school learning environment was created by educational facility planner Bruce Jilk, AIA, CEFPI, and designer Jim Shields, AIA, who are associates with HGA, Inc. in Minneapolis, Minnesota. They combined important educational concepts from the phases of this project with design concepts and tools that are common to educational facility planners.

Basic School Units

The archetype is for a new facility. A new facility provides the best opportunity to develop and illustrate innovative spatial concepts based on new educational designs. But, there are also opportunities to explore renovations of existing high school or other facilities so as to implement the educational ideas. The archetype is not attached to a land site or existing structure. Therefore, it has been shown and described as a *kit of parts*. The parts of the kit include the personal workstation, the one-hundred student family, the four-hundred student neighborhood, and the sixteen-hundred student community.

Personal Workstations

The personal workstation, shown in Figure 8, is the basic unit of the design. Each workstation is furnished with modular furnishings: a desk with a drawer, a chair, and a computer network connection for each student. A group of five workstations is the "home base" for five students; two groups of five are paired to provide for flexibility. Each group of five shares a wardrobe cabinet and round table for group work. This also provides a sense of place and encourages cooperative group work.



HGA

PERSONAL WORK STATIONS FOR GROUPS OF 5 STUDENTS

100-Student Family

The family is comprised of one-hundred students: twenty of the five-student groups that are situated around the resource/production space. The resource/production space, shown in Figure 9, provides areas for instruction, construction, demonstration, and display. Commonly used resource materials, group and individual work spaces, and learning technology are found in this area.

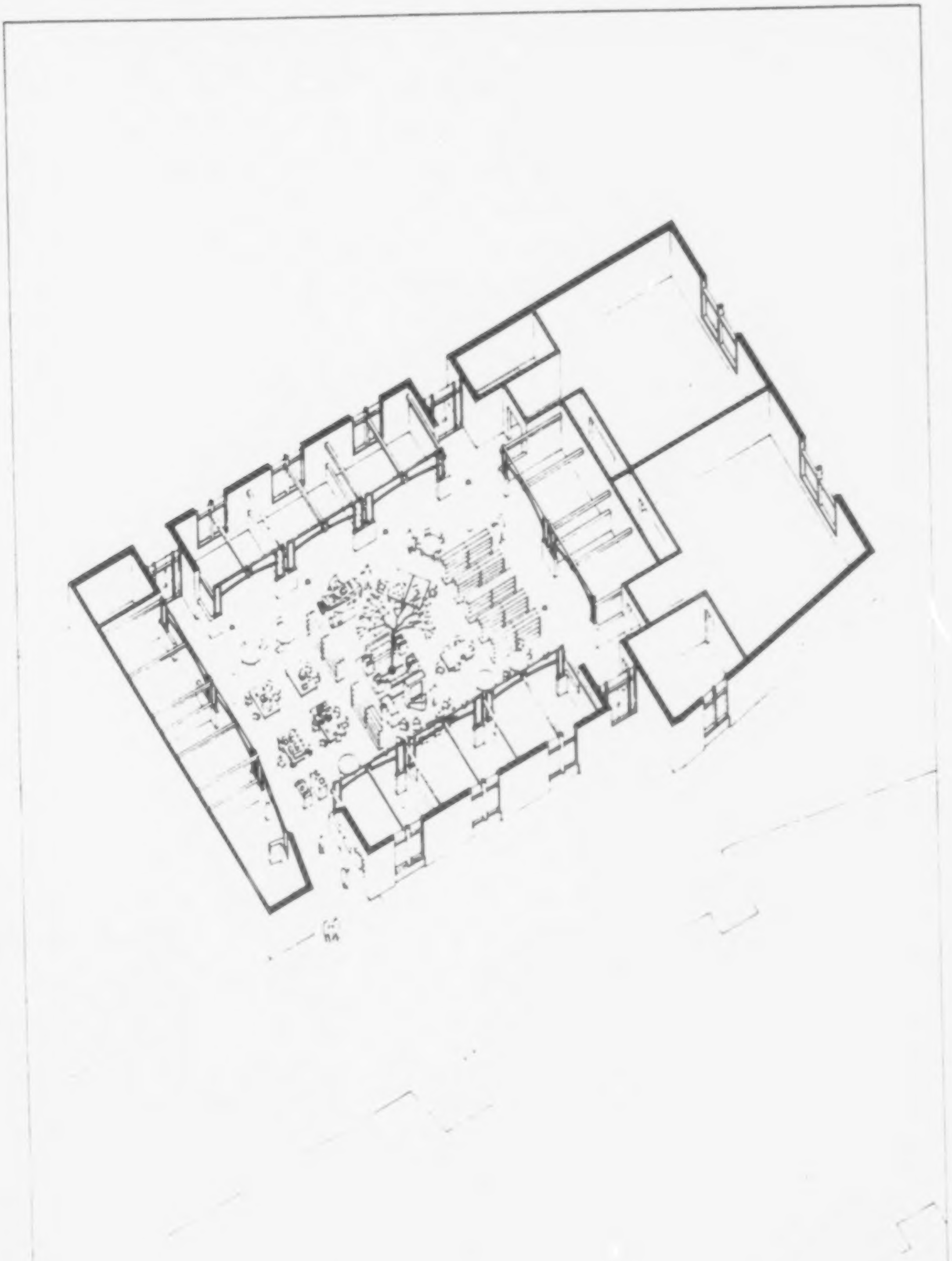
Three other areas at the periphery are spaces for group instruction and flexible laboratories. There is also space for a staff workstation like that available for students. Students and staff will use the specialized technologies, safety features, and larger space of the resource/production area for making and testing their exhibits of learning. The laboratory is the other large space that will be used primarily for experimentation and research. Family staff members also have personal workstations that are clustered in a staff resource and planning area.

400-Student Neighborhoods

Four families and their support spaces are united by the centrally located commons. Each commons is used for dining, studying, and socializing, small and large group activity, and offers entrance into and out of the community. It is a space that students would refer to as "home-like"; it would be a comfortable (but, not too comfortable) place for family activities. The neighborhood contains more specialized studios or laboratories where vocational and academic subject matter can be integrated.

1600-Student Community

Four neighborhoods and the activity block (physical education and fine arts) surround a central forum. As in ancient Roman cities, the forum in this school will be the central location for community activities that draw all four neighborhoods together. The functional areas of the forum are a performance space, print library, governance, school-based store, and community services. It will be a space to house demonstrations and any other activities that are conceived by the students in the community.



VIEW OF A 100 STUDENT FAMILY

Organization and Relationships

The archetype was designed for sixteen-hundred students who would be organized in an interrelated system of units; the unit system allows the design to be useful for other multiples of the units such as four-hundred, eight-hundred, twelve-hundred, or two-thousand students. The individual is the starting point for the unit system. The base unit spaces are then expanded to the level of the workstation, group, family, neighborhood, and community. The unit spaces are organized in a manner that reflects their hierarchical organization in the school, shown in Table 3. Note how the one unit (i.e. the group) becomes the new basic unit at the next hierarchical level. The units have a symmetry that is repeated, despite the change in scale or level.

Table 3
Hierarchy of Unit Organization for the School

Level	Base Unit	Center	Support
Individual	Workstation	Desk	Storage
Group	Individual	Table	Others
Family	Group	Resource/Production	Faculty Group instruction Laboratory
Neighborhood	Family	Commons	Studios Support staff Dialogue room
Community	Neighborhood	Forum	Activity spaces Governance Library Community services
Greater Community	School Community	School	Business Government Commerce Church Artistic

The relationship diagrams (see Appendix J for a complete set of these diagrams) include the graphic illustrations of the space units and the layout, or key-room adjacencies, for each of the spaces. In the relationship diagrams, the arrangement of students becomes more evident. A school community of 1600 students would be arranged by the base units of personal workstation, group, family, and neighborhood as shown in Table 4.

Table 4
Arrangement for 1600-Student School

Personal Workstation Group	5 students	Paired (2 groups together)
Family	100 students	10 group pairs
Neighborhood	400 students	4 families
Community	1600 students	4 neighborhoods

Note: Groups are paired for flexible grouping of up to ten students. Pairing also helps increase the flexibility in the design.

Relationship diagrams also showcase the surrounding setting for the school and the character of the design. The surroundings of a school influence the learning process. For example, some student-learning projects have a real site with specific street locations, orientations, adjoining buildings, and topography. The intention of the archetype, presented in the research and synthesis paper on the topic, was to show the unity with the park, the homeless shelter, the low income housing, the public library, the clinic, the retail businesses, the professional offices, the elder care facilities, and others. All of these have a give-and-take exchange with the school. Although the setting used in this case is an urban one, a suburban and rural setting could be envisioned using similar design principles.

The aspects of character deal with aesthetics and spirit of the design, and create a "sense of place" (Crumpacker, 1992). Character is shown through sensitivity to such things as human scale, personal territory, spatial variation, spatial order, manipulability, access to information and tools, environmental feedback, graceful wear and renewal, work aesthetics, and friendliness (Weinstock, 1973).

High School Space Program

A high school *space program* (shown in Appendix J) is a listing of the base-unit spaces, their number, and their size in square feet. This school was designed for 1600 students. Total square footage is 350,000; this is comparable to a typical comprehensive high school that was built to serve the classroom-based, departmental structure.

Cost

A major objective of the organization and the space program was for the total square footage to be consistent with that of a traditional high school to assure that the cost is comparable. Cost is closely connected to size, as represented by the space program. The facility designers estimated that the 1600-student archetype could be built for about the same cost as a 1600-student traditional comprehensive high school.

Design Specifications

When a new school design is to be created, the more common approach is to review recent projects in publications or in the district across town or in similar towns. Although there is something to learn from others, in this era of rapid change, the process of reusing the "tried and true" is less convincing. Our archetype high school has evolved out of the educational concepts identified in the prior research phases. Some of these ideas have been implemented in isolated places around the country and abroad. Bringing them together with other design specifications into a cohesive whole is, in itself, a sign of hope.

Of the several "break-the-mold" concepts in the design, the design-down process is the most significant. In the spirit of developing an archetype that will provide a basis for others who are creating a new high school, other features of this design include the following:

- The personal workstation group as the basic building block (traditionally this has been the classroom).
- Family groups of approximately one-hundred pupils located in a house structure that provides for individual and group access to the resource/production space as a way to facilitate project focused tasks.
- Neighborhoods, comprised of four families situated around a multiple-use commons, that are virtually stand-alone schools incorporating attention to vocational and academic education. Neighborhoods give students a meaningful environment with identity.
- Flexible studios free school organization from the limitations of the physical environment and facilitate natural integration of vocational and academic education.

- Support staff areas located in as friendly and accessible a manner as possible. That means, there are no intimidating facades with the large letters spelling "ADMINISTRATION."

- Technology permits information to be everywhere and so it is in this design. Instructional materials centers and computer rooms no longer exist nor do the limitations imposed by scheduling access.

- The central forum is open for everyone to experience on an every-day basis and it is the most powerful place in the design for demonstration and display, an important part of assessment. The studio, resource/production area, commons, and community settings also provide places to exhibit learning.

- The school is not complete without being a part of the web of the larger community. This design connects students to their surroundings, as well as providing space within the school for community use.

LEARNING COST*

The final phase of the research involved an analysis of the impact on operating costs for an imaginary New Designs high school under four scenarios. Each of the first three scenarios emphasizes a different feature of the design specifications and the fourth scenario is a combination of the prior three. For each scenario, the reference point was the current cost of operating a traditional comprehensive high school; budget categories and "typical costs" are supported by data from the Educational Research Service (1991). The four scenarios were the following: (1) a learning technology focus, including equipment, maintenance, and staffing; (2) a partnership focus, including capital expenditures, staffing, and transportation costs; (3) a relational staffing approach, including extended flexible roles and responsibilities for staff; and (4) an integrated—or combination—focus, including technology, partnerships, and relational staffing focuses together.

This section of the report will introduce a newer conceptualization of high school staff; the project participants have called it *relational staffing*. A way to think about relational staffing is to use the metaphor of a family. While parents might have primary responsibility for the care, guidance, and education of the children—aunts, uncles, grandparents, older cousins, and others within the community play supporting roles in the upbringing of the children. The New Designs environment is particularly adaptive to a family—or relational—model because of the small unit structure within larger neighborhoods and communities of learners. A relational staffing model is also in harmony with the other design specifications for learning process, organization, and partnerships.

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* The complete analysis is in Rickabaugh, Christie, Copa, and Pease (1992) *Learning costs: Operating cost analysis for the new designs for the comprehensive high school* (see Appendix K).

The primary challenge of the analysis was establishing a cost basis for a typical comprehensive high school today. Data by type or level of school organization was not readily available or particularly useful. Two major obstacles in assembling such data related to the lack of comparability in how districts account for various costs, and how those costs are assigned within the organization: "Expanding information in this arena is another research imperative for the 1990s" (Odden & Picus, 1992, p. 227).

Cost Analysis of Possible Scenarios

Table 5 presents a summary of the operating cost analysis for the four scenarios in relationship to the typical costs of the average, existing comprehensive high school. Discussion of the expected impacts follows. Table 5 is presented as a way to provoke discussion about cost issues. It was intended that the costs be considered on a relative basis; the analysis does not represent absolute costs for any one particular scenario.

Learning Technology

The expected change in costs for an emphasis on learning technology design specifications is shown in the second column of Table 5. Equipment to support a learning technology focus—both the hardware and the software type—will require far more than currently is invested for initial purchases, replacement of worn-out and outdated equipment, and training on replacement equipment. The usability and impact of technology is heavily dependent on the availability of appropriate software and access to a wide range of databases to assist in a student driven educational program.

The cost to support a program of preventive and routine maintenance of technology will be higher than current levels for two reasons: (1) today's technologies is more complex, and (2) the level of current technological maintenance in schools is below an acceptable standard in other environments. The cost of custodial maintenance is not expected to increase in light of the effort to specify an "ownership curriculum." Students can be responsible for the care of their personal workstations and some common spaces.

The implications of a heavy investment in technology on staff-related costs are a challenge to determine because of the varied type and level of sophistication of the technology and the special skills and new roles that are required of staff. New staff roles may include the following: (1) support for the technology itself, (2) support and coordinate change through partnerships related to technology, and (3) looking ahead to new development and planning for the future.

Partnerships

The impact on costs resulting from a partnership focus will vary considerably as the nature, level, and goals of multiple partnerships emerge. However, the underlying partnership premises of shared resources, expertise, and perspectives are that they will lead to more efficient use of the human and financial capital available within the community and, in the larger context, will result in reduced costs (see the Partnership Focus Column in Table 5).

The capital costs of facilities and equipment will be reduced by significant, ongoing partnerships. A prime example is the use of businesses as cooperative working and learning stations. Schools benefit by the co-location of services, shared access to specialized equipment, and joint use of facilities. Shared facilities, equipment, and services can be more cost effective in terms of use levels and students benefit. Additionally, all learners in the school benefit by receiving a more-meaningful and better-leveraged education.

Staff-related costs will be impacted in at least four areas related to partnerships. First, ongoing, moderate cost increases are expected in order to support staff effectiveness in a heavy partnership environment; partnerships require some level of maintenance. Second, staff costs will be reduced where partners with special expertise are utilized to avoid hiring permanent, full-time staff for highly specialized services. Third, the pupil support service function has lower staff costs because of partnerships with other governmental social services. The support role will be more limited to identification of need and referral to co-located service providers. Fourth, moderate increases in staffing costs will result from services needed to identify, orient, supervise, and manage volunteer and partnership staff because these roles do not traditionally exist in high schools.

Relational Staffing

Two primary goals support the concept of relational staffing. These are the following: (1) achieving an optimal match between the resources and talents required of staff members and the responsibilities of the positions for which they are hired, and (2) purchasing the maximum amount of staff time and competence with the financial resources available. Achieving an optimal match between the competence that staff members offer and the requirements of the program positions allows greater flexibility in staffing patterns and in the services offered to students.

As shown in the Relational Staffing Column of Table 5, a relational staffing model in the New Designs environment will cost moderately less than a similar level of support in a typical comprehensive high school. In this model, some staff members will assume greater direct responsibility for the learning activities of students and will provide coordination between other staff and school services. This approach lessens dependence on middle-level administrative services (e.g., department heads, associate principles) and other services such as guidance and attendance.

Some increase in staff development and training costs are expected because of the presumption that all staff will work in a team environment and the assumption that other staff will be moving in and out to fill multiple roles in the family, neighborhood, or community team. Other cost dimensions are not expected to be impacted by the relational staffing focus.

Table 5

Relative Operating Costs of Particular Emphases in New Designs High School as Compared to Typical Present Costs

ERS Budget Category	Typical Cost Per High School Pupil Expenditure @ 1.3 Ratio	Anticipated Change			
		Technology Focus	Partnership Focus	Relational Staffing Focus	Integrated Focus
Total Current Expenditures	$ 5920	+	0	0	0
Total Instructional Services	4002	+	0	0	0
• Classroom Instruction	2939	+	0	0	0
• Special Education	492	0	0	0	0
• Books and Materials	165	0	0	0	0
• Auxiliary Instructional Services	244	+	-	-	0
• Improvement and Staff Development of Instruction	83	++	+	+	+
School Site Leadership	320	0	+	-	0
Total Student Services	463	0	-	0	0
• Health and Attendance	94	0	-	-	0
• Transportation	276	0	+	0	0
• Food Service	18	0	0	0	0
• Student Activities	60	0	-	-	0
Board of Education Services	33	0	0	0	0
Executive Administration	111	0	0	0	0
Central and Business Services	143	0	0	0	0
Maintenance and Operations	492	+	0	0	0
Environmental Conditioning	159	+	0	0	0
Other Current Expenditures	195	+	0	0	0
Capital Outlay	284	++	0	0	+
Debt Retirement	176	0	0	0	0
Interest Paid on Debt	120	0	0	0	0

Note: ++ Substantial increase of more than +20%
+ Moderate increase of +5% to +20%
0 Little or no change anticipated +5% to -5%
- Moderate decrease of -5% to -20%
-- Substantial decrease of more than -20%

Note: Operating cost changes have been analyzed from the perspective of the high school only. No attempt has been made to document and report potential "cost shifts" to other segments of the community.

Note: ERS is the Educational Research Service.

Integrated Focus

The interplay of the three primary areas of focus—learning technology, partnerships, and relational staffing—has a synergistic effect that exceeds the impact of the three dimensions when they are considered separately. After considering each perspective individually, the learning costs associated with an integration focus were projected and analyzed, as shown in the Integrated Focus Column of Table 5.

A moderate increase in costs can be projected in two areas: staff development and capital outlay. The New Designs high school requires that the staff work in multiple (and, at times, new) roles under a staffing philosophy grounded in the needs of the learners--adolescents and adults—and interpersonal support. There will be an ongoing need to support further training and development.

In the integrated focus, the direct capital outlay for learning technology is projected to be moderate, but far less than in the technology focus because partnerships will distribute the purchase, access, training, and maintenance costs. The support of technology requires a variety of skills and positions not present in the typical comprehensive high school. A relational staffing model is a way to provide for technical support and troubleshooting, monitoring, and experimenting with new technology, and support and management of the new technology implementation.

In summary, the integrated strategy which analyzed the cost impacts of three different emphases (learning technology, partnerships, relational staffing) indicated that there will be a synergistic effect that will minimize the impact on the bottom line for operating costs. It appears as if, given the level of creativity suggested by the above analysis, the New Designs high school will have operating costs about the same as the typical comprehensive high school. A bonus for students comes as greater connections with community adults, access to more community learning resources, and more authentic and complex learning processes are provided.

The operating cost analysis was presented with one caveat. Those responsible for operating budgets must pay attention to the "cost shifts" as well as to the operating costs. Cost shifting can be understood within the context of the total community investment in public secondary education. That is, a community that is planning to operate a school according to the design specifications needs to be mindful of the costs to the learning partners as well as the operating costs that might appear in the school budget. It is projected that under the integrated strategy, the overall investment in secondary education will be optimized. This suggests that with a constant level of student learning services, the overall cost will be lower, or, with a constant investment of community resources, a higher level of educational services will be available.

Design Specifications

Several important factors should receive attention by any group contemplating the comparative costs associated with operating a comprehensive high school according to the recommended design specification. They are as follows:

- Operational costs associated with the traditional high school, while useful points of reference for comparison, are not necessarily adequate or appropriate to accomplish the mission of high schools.

- Operational costs associated with implementation of the new designs will vary in response to local circumstances and conditions. This variability should be taken into account by local planning committees.

- Equipment and material costs will increase as technology utilization increases, but partnerships and relational staffing arrangements can potentially offset a significant portion of the costs.

- The more students take responsibility for the care and cleanliness of their work spaces, the less likely are custodial and maintenance costs to increase significantly.

- The more the work environment of the high school is organized and operated consistent with the adult world of work, the more opportunities are created to share equipment, materials, human resources, training activities, and to contain costs.

- Increases in partnership activities are likely to be accompanied by increased transportation needs.

- A relational staffing approach based on a "family" metaphor offers a variety of possibilities to utilize special expertise and multiple roles in a flexible response to student learning needs without increasing costs significantly.

- Creative partnerships involving shared equipment, facilities, and staff can result in significant new access opportunities to students without significant new costs to schools and their partners.

WHAT WE HAVE ACHIEVED:
SUMMARY OF UNIQUE CONTRIBUTIONS

A two-year enterprise to synthesize educational research and practice in order to specify possible new designs for the comprehensive high school has ended. The task engaged a group of interested educators and community people from across the United States. Those involved in the Design Group labored to resolve hard problems. As might be expected, they uncovered even tougher issues for future discussions regarding the design of the comprehensive high school. In the process, the Design Group more fully developed a set of features for a twenty-first century high school. The important features built into the new designs for the comprehensive school are as follows:

- Public high schools are "people made" according to what is believed to be right or fashionable at the time. For just this reason, high schools can be "rebuilt or reconceived" by other people, in their own time, to meet the needs of the learners, the society, and the nation.

- A learning signature is a powerful representation of the special focus and character of a school. It gives coherence and spirit to learning.

- Learner outcomes represent common standards for all students; outcomes are closely linked to future life roles and responsibilities for all students.

- Learner outcomes can be reached in multiple ways which are responsive to learning styles and interests.

- Authentic assessments are the expectations for learning that include both knowing and applying learning to life situations.

- Curricular integration of high-level modern vocational and academic education is an essential part of the common education for all students.

- Partnerships diversify learning settings and improve learning effectiveness.
- Operating as a learning community that pays attention to caring, attachments, and expectations often requires the subdivision of large schools into smaller units.
- Relational staffing encourages teamwork, attention to unique learning needs, and full use of the educational talent and energy available in a school and community.
- Innovative and extensive use of learning technology enhances learning and expands the boundaries of community.
- Decision making is consistent with overall aims, yet is located close to the problem at hand.
- Costs to operate are approximately the same as for a "typical" high school, although "cost shifts" may occur between budget categories and between school partners.

WHERE WE ARE: LESSONS LEARNED

The preceding main sections of the final report describe the major contributions from the project. They are expressed in the form of a set of design specifications and features. The rationale for the specifications and features received only a terse account in the text of the final report. A complete account is available in the research and synthesis papers that were prepared for Phases 1 through 7 of the project (presented in full in Appendices B-K to the final report). In addition, there were several lessons learned in the conduct of the project.

Lessons Learned

There were lessons learned along the way of coming to the conclusions about new high school designs through the collaborative process used in this project. Some of the insights were

- Good ideas could come from a wide variety of sources—students, teachers, community representatives, educational facility planners, newspapers, journals, and books.

- Designing-down was a challenging process. It called into question many accepted educational practices and required that one continually go back over prior decisions to check for consistency. Relationships among design components became more interactive and iterative, rather than linear, as insights from an earlier phase affected the later components. The design process took the form of Figure 10, as contrasted to the earlier process portrayed in Figure 1. These insights sometimes led to changes in the design specifications for the earlier components. Care was taken to maintain the integrity of the design-down process as a major design strategy.

- Working out the design specifications in terms of issues considered, perspectives examined, and values taken was *as important* to the process as the resulting specifications. For this reason, "significant questions" were developed regarding each component of the design and are presented later in this section as the basis for continuing the conversation about high school design. The design specifications (as presented) could serve as a starter list or as a model. Each school district could initiate its own design process, taking into consideration the list of specifications and questions.

- A new language began to emerge in the design-down process as the Design Group grappled with new ideas and relationships for the design of high schools. At times, there was need for a glossary to support and interpret the new design specifications and discuss their merits and implications.

- There continued to be a struggle with the issue of how far to move out on the horizon with new design models. The trade-off was between a feasible, new version for design of comprehensive high schools that was familiar enough to elicit public support and a bolder version that broke with tradition sufficiently to realize significant improvements in the learning process and outcomes for all students.

- Some of the design specifications were already a part of educational practice in some locations. They may not be as risky to implement as some might think.

- Among people in traditional school roles, there was a lot of wisdom and energy to deal with the design specifications and issues. The individuals who took lead roles in developing research and synthesis papers and served as Design Group members were clear testimony to this lesson. A good design process will give permission and encouragement to students, teachers, administrators, technologists, facility planners, among others, to make their views known in a formal way.

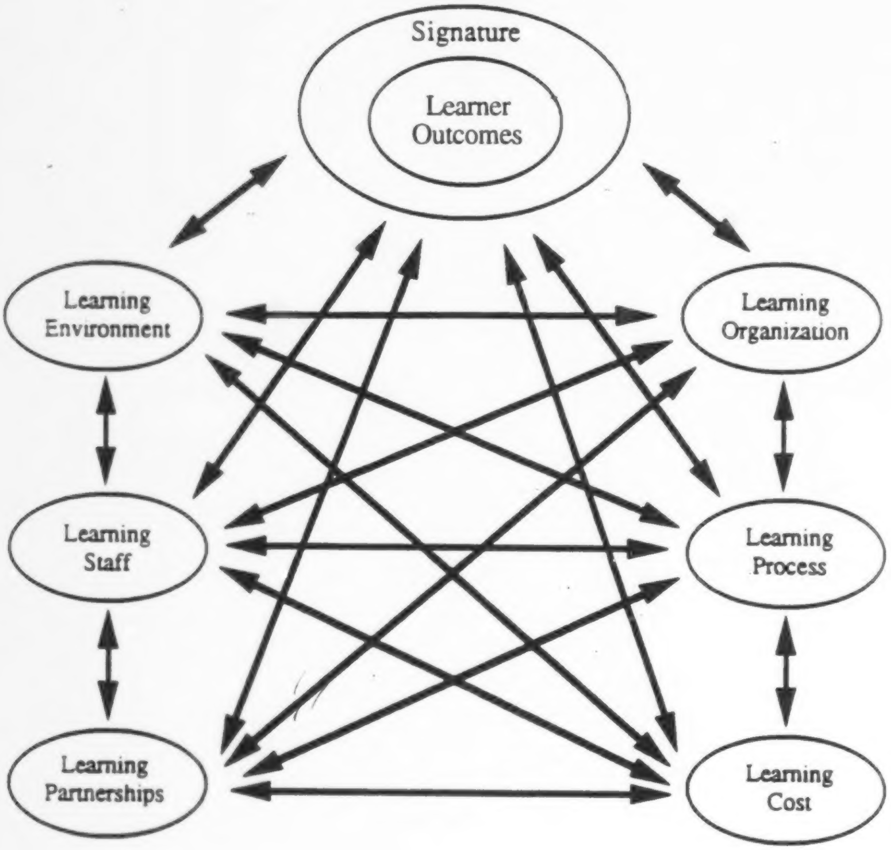
- After focus group research sessions with students, teachers, administrators, or researchers, one or more individuals usually commented that "we never talked like this before." In some instances, the group members continued their discussion after the formal meeting. Focus group research was an intervention with significance that went beyond the planned collection of data that was the purpose of the effort.

- The issues of the comprehensive high school are national issues; it does not matter if it is in rural South Carolina, Michigan, New York, or in suburban California. The solutions do, in fact, have national application and there continues to be value in having people from across the country dialogue with one another around these issues.

- Many of the recommended design specifications are supportive of current thinking regarding educational reform. When these specifications are carried through to show the operational implications for actual school designs, one can see far beyond what is typical high school operation today.

Figure 10

Actual Design Process for New Designs for the Comprehensive High School


Signature
Learner Outcomes
Learning Environment
Learning Organization
Learning Staff
Learning Process
Learning Partnerships
Learning Cost

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RECOMMENDED NEXT STEPS

It has been difficult to develop and express the New Designs vision of the comprehensive high school of the future in ways that break with the old mindset about high schools. The Design Group acknowledges the difficulty facing practicing school administrators, staff, students, and partners who will seriously attempt to move ahead with these ideas. We recommend the next four steps for action.

Recommendation One: Dissemination of New Design Specifications

The results of the New Designs research should be disseminated in order to inform those who influence public education about the ideas for specifying new designs for the comprehensive high school. The goal of dissemination is to create general awareness and provide basic information about the project results. Successful dissemination would be indicated by wide publicity and acceptance by vocational and other educational leaders who influence the course of public education and high school design.

In order to have an effective national dissemination that is feasible within the constraints of available time and resources, four target groups were identified: (1) research proposal writers interested in reforming schools, (2) educational writers for the popular press, (3) other researchers supported by NCRVE who could incorporate new designs for high schools into future research and writing, and (4) the project design group who had ready access to the strategic organizations and agencies they represented. These groups are thought to have the best chance to influence education and school design from our leverage point.

The dissemination strategy should also provide more detailed information and resources for those groups that see some possibilities for implementation in their situations. More information and resources could be made available in several forms: (1) complete written reports, (2) presentation packages containing audiovisual or multimedia materials, and (3) presentations by individuals from one of the targeted groups listed above.

Finally, an effective dissemination strategy will take advantage of existing niches and networks of reform-minded individuals who already have a natural inclination to be involved and affinity for new information. For example, in this project, the authors of the research and synthesis papers proved effective in dissemination of new design concepts to their colleagues in their specialty area. The architect can take the ideas to associations of facility planners. Another illustrative network could be schools across the country involved in implementation of outcome-based education—a central theme in this new design project.

Recommendation Two: Pre-Stage for Implementation

Local design teams that are serious about redesigning the high school will need to work through each phase of the design-down process. Prestaging for implementation includes plans to (1) manage the design process and (2) prepare the leadership for the consequences. We attempted to model both aspects of prestaging in this project.

The design process is explained in this final report and the agendas for the Design Group meetings are included in Appendix A. This information can serve as a guide for local design teams. Leadership also needs to prepare itself for the consequences of changing the status quo of the high school. They will need to be prepared to respond and facilitate discussion about critical educational issues that will surface in each of the design phases. To help in anticipating what these issues might be, a set of "smart" questions was developed as result of the review of research and good practice and a discussion of each component of high school design. They appear (in full) in the final section of each research and synthesis paper in Volume 2. The questions are summarized briefly below.

Learning Signature

1. What should we do about insuring that all interests have a voice and are considered in selecting a learning signature? Arriving at consensus on a signature for a comprehensive high school without excluding any students in terms of gender, race, age, ability, needs, or interests was difficult. Exclusion can be very inadvertent but, nonetheless, consequential.

2. Should a learning signature be selected once and for all, or should the selection process (which may be as important educationally as the resulting signature) be repeated over time?

3. Is it best to have one signature for the whole school, should it be selected by the whole group, or should different groupings of students within the school be encouraged to develop their own signature?

Learner Outcomes

1. Who should be heard before the outcomes are written and who should write them?

2. What knowledge and experiences are most worthwhile to learners for inclusion in the outcomes. What should be done about linking outcomes to the life roles and responsibilities of learners?

3. Should values and beliefs be outcomes? If so, which values and beliefs (cultural, moral, occupational, social, spiritual) are to be included?

4. Can some of the learner outcomes be more capably addressed by shared effort with—or leaving them entirely to—other institutions and organizations in the community?

5. What do the words making up learner outcomes mean for practice?

Learning Process

1. Who should decide the composition of the learning process? What criteria should justify these decisions?

2. How are curriculum, assessment, and instruction to be interrelated and mutually supportive?

3. What orientation is to be taken toward curriculum (i.e., structure of disciplines, technology, social reconstruction, cognitive process)?

4. What are the purposes of learning assessment? How will these purposes be served in the assessment process?

5. How will assessment attend to demonstration of learning in life contexts? What role should the school play in "giving credit" for learning acquired outside the school?

6. How will instruction be designed to meet the needs of diverse learning styles, the full range of human talents, and all levels of learning objectives?

Learning Organization

1. Is it possible to reorganize schools if the norms and politics of the community go unchallenged and not talked about?

2. How should an integrated curriculum find the balance and needed interaction of the various subject matter to prepare for future life roles of learners?

3. How can the risks often associated with expanded learning settings be managed in a legal environment of schooling that is based upon fault-finding?

4. How can learning time be organized and managed to provide flexibility for learning, yet efficiently use the learning resources?

Learning Decision Making

1. How can we make sure that the decision-making process remains open to improvements that go beyond the recommended design specifications in the report?

2. What should we do to avoid the possible negative effects of challenging goals and striving for efficiency (i.e., exploitation, leaving the slow behind, apathy and frustration in goals not met)?

3. How can we learn to consider the views of those whose cultural background and beliefs may cause discomfort with the decision-making processes about learner outcomes, learning process, learning organization, and other components of the new designs?

Learning Partnerships

1. What should we do to facilitate partnerships that are mandated by top-down pressure—such as state policy requirements—to be successful?

2. Are schools and potential partners ready and able to commit the time and the training necessary to sustain collaborative partnerships?

3. Why are schools often leery of business and industry forming partnerships with education?

4. How can we deal with the ambiguity that naturally exists when people from different backgrounds work as partners?

5. Are educators willing to move from a service/delivery model (provider and client, professional and target audience) to a partnership model (shared power, goals, and accountability) of education?

6. How can we move from rhetoric to actually implementing collaborative partnerships?

Learning Staff

1. How can the staff selection process be developed and carried out so that the desired staff competencies are available in high schools?

2. Can an existing staff implement the proposed new designs?

3. How can staff development be managed when many of the individuals responsible for the design and implementation of staff development may not themselves represent the desired characteristics expected of students and staff?

4. What should the staff development process do about continuing to improve the alignment among the components of the new designs for comprehensive high schools and the overall improvement of those designs?

Learning Technology

1. What technology can be used to increase students' productivity as they work toward attaining valued learner outcomes?

2. What tools will foster students' multifarious exhibitions of competencies associated with the outcomes?

3. How can technology create and strengthen the bonds of community among teachers, students, parents, and others?

4. What should be done about ethical dilemmas involving the use of technology?

5. When is learning technology the best use of limited resources, and are there other ways to gain access and use?

Learning Environment

1. What resources exist in the community (rather than in the schools) that might provide better educational experiences for high school students?

2. What stops us from connecting more closely with the community and are those reasons justifiable to today's young people in terms of their educational opportunities?

3. We can eliminate the vocational and academic wings of the high school, but in what other covert ways does the high school stratify students?

4. If "letting go" of traditional, but anachronistic, high school designs causes discomfort, how can we honor the past, yet move ahead?

Learning Cost

1. How much support and orientation will students coming from a traditional middle school or junior high school require for success in the New Designs high school?

2. To what extent will technology be made available to all students outside of the school environment? Will all students have access to technology at home?

3. What will be the impact of the New Designs specifications on special needs students?

4. If success is achieved at the point where students move on to new learning, how might present, built-in course redundancy be reduced? And, what would be the financial impact?

5. What will be the status of co-curricular activities?

6. To what extent will students be responsible for maintaining the school community (e.g., custodial services, tutoring other students, school governance)?

Recommendation Three: Implement the Design Specifications

We recommend that New Designs prototypes be established as a way to test out and refine the design specifications. There are two markets for the design specifications. These markets are communities with the opportunity to build new high schools and communities that wish to make significant improvement in existing schools.

The primary market for the products of this project is school districts with the opportunity to build a new school. Building and staffing a new school would permit full implementation of new designs without the typical barriers. School facility planners can use the design sketches that are a part of this final report to begin serious discussions about options. They can also use the final report as a model for rationalizing their facility decisions to funding and approval groups such as taxpayers and state education department facility supervisors.

A secondary market includes existing school districts that are moving in either of two directions as a strategy for significant high school improvement. They could be existing schools that wish to implement a laboratory school (e.g., school-within-a-school) within a larger comprehensive school unit, or they may be existing forward-looking school districts who are not yet sensing problems requiring action with their present high schools, but are mindful of new possibilities.

The primary purpose of the experimental sites would be to pilot test the design specifications under different conditions. School conditions include size, construction opportunities, and restructuring approach. Other conditions are established by state legislation, local traditions, and cultural influences. More specifically, the site personnel would strategically plan to implement the design specifications considering the following: (1) local development and implementation cycles; (2) barriers of and strategies to waive regulations; (3) existing local systems of reform and change; (4) existing small-scale pilot tests and idea-incubators representative of the proposed design specifications (e.g., integrated curriculum, applied academic courses, business partnerships, articulated programs, and cooperative teaching and learning); and (5) the presence of benchmark standards from best educational practices.

Recommendation Four: Evaluate Student Achievement

The aim of the Design Group was to create high school designs that would provide better educational opportunities and outcomes for all students. Therefore, it is important to test whether the design specifications lead to improved outcomes for more students in the following areas: (1) relevance to their lives in family, work, and community; (2) equitable educational opportunities and outcomes in both vocational and academic education; and (3) reaching higher levels of learning for all students.

Measuring achievement that is relevant to life, as regards to work life for example, is under development by Stone, Hopkins, Stern, and McMillion (1991), the American College Testing (working on an assessment of the SCANS competencies), and Educational Testing Service (WorkLink). New developments in measured achievement related to family life and community life need to be investigated accordingly.

Achievement in the area of equitable education opportunity can take its direction from the work of Oakes et al. (1992) who developed a model for logical analysis of student transcript data for patterns and probabilities of academic track placement. The model should be extended to a more extensive data set as a way to establish a basis for achievement measurement. Specific examples of measuring gains in education equity and outcomes include the use of the National Assessment of Educational Progress in the Southern Regional Education Board (SREB) pilot schools and the National Assessment of Vocational Education. Moving toward higher levels of learning for all students as an indication of more productive schools can now be investigated by focusing on the evaluation efforts of schools that are implementing outcome-based education.

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